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## Science in the Primary Grades

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WHO will deny that today, more than ever before, the field of science has become an integral part in the educative process and merits a prominent place in the curriculum of all grades? Education should have, as one of its prime objectives, the training of a child's mind and heart to know and appreciate the good, the true, and the beautiful things in life which are found, not in some far-away mythical kingdom of the imagination, but in the world about us.

"The happiest life has the greatest number of points of contact with the world, and it has the deepest feeling and sympathy for everything that is."<sup>1</sup>

Because science is so intimately bound up with life and living, it furnishes excellent means of achieving the end. The study of science is, then, a vital means of interpreting the world in which we live and the earlier this training is introduced in the life of an individual the deeper and more lasting ought be the results.

There are many people who go along in life with little or no enthusiasm for or even interest in the world of nature — the life of the living — about them. True, they are awed by the spectacle of a Niagara, or the beauty of an orchid, or the variegated plumage of a peacock; but a little brook on its way to the sea, a wild flower nestling under some dusty foliage or a little mouse scampering through a field of grain, provoke little or no interest. Why? They are of the commonplace. Yet they, too, are a part of God's great plan of nature and a man or woman trained in youth to observe these things intelligently matures with a far keener insight into life coupled with a fuller realization and appreciation of its meaning.

### Learn from Observation

The subjects to be introduced for the little ones should be within the range or scope of their experience such as personal contact with pets, birds, and insects.

"Much so-called nature-study teaching is merely telling the child what some man has found out. Bacteria, sheep's brains, life histories of difficult insects, chemical changes in germination,

**EDITOR'S NOTE.** The Sisters who prepared the article on "Science in the Primary Grades" have indicated suggestively the beginnings for the teaching of science in the life of the child and in the environment of the child. The study of God's creatures in relation to the Creation is a happy correlation and pedagogically wise.

pollination, yeast, fermentation — these and a hundred others are beyond the child's realm."<sup>2</sup>

The dog is a familiar pet of children. They play and pet their dog. They feed him and care for him, yet all this is done with a minimum amount of understanding. If there is proper guidance the child can easily be led through direct observation and experimentation to formulate reasons for various reactions noted in

the specific pet. If it be a dog, why does it bark and give little squeals one time and at another growl and whine? Why should caution be taken if the damp, soft skin that covers the dog's nose becomes dry? These and many more observations tend to broaden the outlook of the child and make him more alert and responsive to his everyday commonplace experiences. Such observations may be made with similar pets and also carried into the study of insects and birds.

Children of the primary level show keen interest in field trips or excursions. One needs only to watch a group of active youngsters and listen to the many and varied questions enthusiastically and rapidly placed. Children love to investigate their environment, they delight in discovering things for themselves. Specific knowledge gained through actual experience stimulates youthful enthusiasm for further investigation. A group of children visiting a farm would be impressed, quite likely, by a mother hen and her family, a cow and her newborn calf, or a little pony and her mother. Feeding time deeply engrosses the attention of all. What and how does the animal eat? What are the food requirements of the young? What about their skin covering? Different animals have different food-getting structures. By means of contrast and comparison it will be ascertained that every species has special adaptations for its convenience in obtaining proper food and safeguarding as well as preserving life. Here it is well to familiarize children with the concept that both animals and plants are living things, that they undergo similar growth processes, and that they are equipped to supply themselves with food. Further, we might stress the fact that we are very dependent upon both plant and animal

<sup>1</sup>Bailey, L. H., *The Nature-Study Idea* (Doubleday, Page & Co., New York), p. 14.

<sup>2</sup>*Ibid.*, p. 136.

life. Frequently children have the idea that only animals are living things because they are able to change positions, move about from place to place, make noises, and the like. Direct learning and reasoning through experimentation with living plants and animals will enable the children to acquire a deeper and more lasting impression. Plants and animals should be kept in the schoolroom where the children will have an opportunity of studying over a period of time the noteworthy characteristics of such animals and pets as the turtle, rabbit, guinea pig, white rat, polliwog, crayfish, and snail. The children should be made responsible for the feeding and care of classroom pets. The more familiar wild animals should be discussed — their appearance, young, food, homes, habitats, skin covering, and other peculiar characteristics. Trips to the farm, woods, parks, and zoos intensify interest in the study. Also plants of various kinds may be kept in the classroom. Visits to greenhouses and flower shows may spur on a desire for or interest in a flower garden at home. Elizabeth Barrett Browning has struck a vibrant chord in her well-known lines:

"Earth is crammed with heaven,  
And every bush afire with God,  
But only he who sees  
Puts off his shoes."

This brief survey of subjects to be introduced ought to afford an adequate means of training the minds of children to interpret the world in which we live from an interesting and accurate scientific viewpoint.

#### Creatures of God

The art of teaching science to children of the primary level is not nearly as complicated as many would think. Children show a natural curiosity to learn about the things in their environment. Proper guidance, of course, is necessary to insure scientific accuracy and to lead the children on in their endeavor to obtain more information. Children often on their own initiative furnish the motivation for activities. One may not often think of using the Creation as a motivation for the teaching of a science activity. But why not? After a little reflection we find that the Creation furnishes one of the finest backgrounds upon which to build. In religion the little ones are taught — God made the world — He made the sun, moon, and stars — He made the birds and fishes — He made the trees and flowers — He made the animals and everything on the earth. The children may wish to make a booklet showing the various things God made. They may visit the zoo, park, or farm with stress being applied — God made this bear, this elephant, this bird. God made these trees. He made all these things for me to enjoy. In these lines of Longfellow we find the expression of a similar sentiment:

"And Nature, the old nurse, took  
The child up on her knee,  
Saying, 'Here is a storybook  
Thy Father has written for thee.'"

The benefits to be derived from the teaching of science in the primary grades are many. Educators are aware that science is a vital factor in education and an intimate part of the young child's growing experience. It trains youthful minds in better habits of thinking, awakens interest in the life around and about them, leads them into new topics of investigation, thus enriching and extending their mental horizon. Moreover, it makes children more independent in approaching a new problem and stimulates their interest in the phenomena about them.

#### Correlation is Easy

Balanced, integrated reading material is now available for the primary grades so that children can have story reading

and study reading with a wide range of interest. The study of science requires much oral discussion through which children learn to speak naturally and with ease concerning a great number of interests. Religion, as was seen, can be correlated with science to bring about in the heart of the child an enduring sentiment of gratitude for the gifts of God. Not only in these subjects, but also in art, music, spelling, and arithmetic, science holds a place and a very prominent one. In the field of art children who have had actual experience in caring for pets and animals will naturally delight in drawing and painting pictures, in modeling clay miniatures, or in making illustrated pet booklets with a sentence or two noting the characteristic features of the particular animal. It is easy to see the importance of arithmetic in the building of a cage for a pet, measuring the amount of food required for feeding, keeping a record of the weight of the animal, cost of materials, such as food tray, boards used in construction of cage, and other necessities.

Frequently the children write letters asking for information, notes of appreciation, and the like, where they feel a definite need for the mastery of spelling words to be used. The informative sentence below the illustration of their booklets will furnish additional need for spelling and also a repetition and drill on the more frequently used words.

#### Varied Activities

Nature, in its various aspects, invites all her children to join in song and rhythm. The swaying of the trees, the melodies of feathered songsters, the chirp of crickets, and the music of some rippling stream have an irresistible charm for nature-loving youth which is difficult to describe. Children love to express their sentiments through rhythm. One day they may wish to be sprightly dancing fairies in the beautiful warm sunshine to the accompaniment of the staccato strains of some lively tune, while on another day the slow, laborious step of the elephant will have a greater appeal. Songs of birds, pets, and insects never lose their appeal for the happy and carefree youngsters.

As each new science unit is introduced, corresponding activities will naturally suggest themselves. In the fall a visit might be made to the farm to observe the ripening fruit on the trees, the gathering of corn into bins, the harvesting of potatoes, pumpkins being gathered and carried to cellars, nuts stored away for the winter. After an excursion of this kind children return to the classroom eagerly anticipating a discussion of their experience. A reading-chart record based on the children's experiences adds lively interest and enthusiasm to any reading program. The children may wish to construct a food store showing market products which are typical of the autumn season. Additional visits to the local grocery stores will aid the children in planning and arranging their own store or market. Here the teacher must be careful to allow the children to use freedom and pupil initiative, providing only as much guidance as necessary. Finished products are not to be expected from the child of the primary grades.

By the teaching of science in the primary grades new avenues of learning are opened wherein little minds can be trained in better habits of thinking, mental alertness in the independent solving of problems concurrent with everyday life, and a useful knowledge of the life of the living about us.

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## Science in the Grades

### A School Sister of Notre Dame

**C**HILDREN naturally are interested in their environment. From the time they are able to speak they demand an explanation of the why and wherefore of the natural phenomena surrounding them. If, instead of stunting and often even killing this desire for knowledge, a systematic course in science were included in all the grades, the child would receive a training in scientific thinking that would serve to broaden and enrich all his future studies.

#### Objectives of Science

"From nature to nature's God" is the motto of the Catholic teacher of science. Her chief objective is appreciation of the universe, and an intense love for the Creator of the universe.

Bulletins 35, 1918, and 26, 1920, published by the National Education Association, set up seven objectives of secondary education which may be of use in the elementary schools as well. The seven objectives are: (1) Health; (2) Command of Fundamental Processes; (3) Worthy Home Membership; (4) Vocation; (5) Civic Education; (6) Worthy Use of Leisure; (7) Ethical Character.

1. *Health*. The formation of sound health habits should be constantly before the mind of the teacher. Very effective health lessons can be given in every grade of the school.

2. *Command of Fundamental Processes*. A certain amount of laboratory technique may be effectively taught even in the primary grades, although it is carried on more extensively in the seventh and eighth grades.

3. *Worthy Home Membership*. With this objective in mind, the science teacher will include in her course work in gardening, beautifying the home, caring for clothing, and repairing simple devices used in the home.

4. *Vocation*. Who more than the science teacher can aid her pupils in the selection of the vocations for which they are fitted? Grade-school science has vocational value through the general fund of information it imparts. The better the understanding of the various occupations, the better the chance of making a wise decision.

5. *Civic Education*. To educate the child so that he becomes a worthy member of society in the city, state, and nation is an objective that will inspire lessons on prevention of disease, pure water supply, protection of forests, and similar topics.

6. *Worthy Use of Leisure*. In this day and age, when leisure is more or less forced upon all people, and when dissatisfaction and crime are frequently the result of not knowing how to use this leisure, education must come to the rescue. The science teacher can help immensely by fostering hobbies, such as collecting butterflies, moths, woods of various types—or making scrapbooks, and building models of various machines.

7. *Ethical Character*. No one would question the importance of ethical training, least of all the science teacher who can teach many valuable lessons, especially in units dealing with the biological subjects.

There are many minor objectives which may be worked out by the individual teacher, but the above-mentioned constitute the principal ones to be considered in the teaching of science.

#### Selecting Subject Matter

The subject matter of a course in science for the grades should be based on the experiences of the child and should increase a knowledge of his surroundings. The curriculum should include material which relates directly to

the activities of the child, and is, therefore, interesting. The subject matter must be worth while and of sufficient difficulty to require scientific thinking. Lastly, subject matter should be selected with a view to developing correct study habits, desirable attitudes, and lofty ideals.

The same curriculum will not serve for both city schools and rural schools, although there are essentials that should be included in all courses of study.

#### Organizing the Course

The best plan to follow in the organization of material, is to prepare a syllabus, as New York has done, in which the work of each grade is carefully outlined and in which the units of all grades are similar, but extended in scope and difficulty as they advance through the grades.

It would be well, after all the material has been gathered, to organize it into units all of which follow the same general plan. In this way, the pupils, having learned the method of working out one unit, may carry this knowledge and skill throughout the entire course.

In organizing the unit one may follow the general plan accepted by most educators of the present day.

1. Title of the unit.

2. Problems, the purpose of which is to arouse the interest of the pupil.

3. A short introduction to the subject matter of the topic, which is intended to further attract the pupil and give a general idea of what is to follow. This "Story of the Unit" may be written to appeal to the economic, the romantic, the aesthetic, or the historical aspect of the subject.

4. The body of subject matter follows. This may be divided into problems, stated in the form of questions, which the pupil is expected to attack and solve. In this section are included

exercises to be worked out by the pupil and submitted either orally or in writing, and experiments to be performed either by the pupils themselves or by the teacher, as demonstrations.

5. Each unit may be followed by a summary or review exercises on the unit, and by a list of additional exercises and projects.

6. A list of references added to each unit, while not essential, is a great aid to further study and special reports.

Following is a list of suggested units that would constitute a course in science which could be worked out to serve all the grades:

1. The Living Creatures of the Earth.
2. The Earth on Which We Live.
3. Weather and Climate.
4. Obtaining a Good Water Supply.
5. Keeping in Good Physical Condition.
6. The Clothing We Wear.
7. Protecting Ourselves from Disease.
8. The Community in Which We Live.
9. Simple Machines Used by Man.
10. Lighting Our Buildings.
11. How Men Travel.
12. Communicating with Our Neighbors.

In connection with the outline a textbook should be used, so that the child has a definite source of information. The text should be one of recent publication and the best available.

Besides the text, of which each child has a copy, there should be in the classroom, numerous reference books to which the child may resort for further information on topics in which he may be especially interested.

#### Choice of Methods

Much has been said and written regarding methods of teaching science. Which one shall we use? That is a question which must be answered by each individual teacher.

Although the lecture method may sometimes be used to advantage in colleges and senior high schools, it can scarcely be of service in the grades.

The textbook-recitation method is rarely used in the teaching of science. Rarely is this method used alone, but it is generally combined with some individual laboratory work, demonstration experiments by teacher and pupil, and notebook work.

It has been shown by experiment that the lecture-demonstration method, when properly used, has more lasting results than any other method.

The project method, while arousing the child's interest, teaching self-

reliance, developing initiative, and teaching the child to depend on his reasoning ability more than on his memory, requires more time than can ordinarily be given. Besides, all the children do not cover all the subject matter and thus fail to obtain a knowledge of the entire field.

It would not be well for the science teacher to adhere strictly to any one method of teaching. She must discover for herself the combinations of methods which will be most effective in her teaching.

#### Arouse and Maintain Interest

Just as the salesman who wishes to be successful, must arouse the interest of his prospective buyer, so must the teacher stimulate the interest of the child in order to sell her subject. The interested child is the least difficult to manage and the easiest to teach.

Perhaps the best way to arouse interest is by the use of real specimens. A cage made of wire screening and equipped with a door may be used to good advantage if one wishes to keep live specimens in the laboratory or classroom. Have the floor of the cage made of a solid piece of metal turned up on all sides to prevent leaking. Cover the floor with ground and in the center place a shallow pan filled with water. If grass seed is planted this will soon make an inviting habitation for live things which the children will delight to bring to class, such as, toads, frogs, salamanders, caterpillars, and other specimens. An alert class will catch the caterpillars in the act of spinning cocoons or forming chrysalids and later have the joy of seeing them emerge as adult moths or butterflies.

Aquaria containing live fish, snails, turtles, and various forms of plant life, will not only hold the interest of the children, but will serve at the same time to teach scientific facts.

Valuable collections of leaves, insects, bird nests, and various kinds of wood may be made by children living in the suburbs, in small towns, or in country districts. The leaves, pressed, mounted, and identified, add a scientific atmosphere to the classroom. The insects, killed, dried, and identified, should be mounted in a frame on a background of cotton. For the wood collection, have the children cut pieces 8 in. long from branches about 2 in. in diameter. Cut the pieces half way down on the length and saw crosswise, leaving only half the piece at one end. Shellac the cut surfaces to prevent insects from destroying the specimens. Identify, label, and nail the pieces to a narrow strip of wood.

The value of the collection is greatly enhanced by mounting with the specimens, pictures of trees from which they were taken.

Well-planned field trips should be made by children of all ages. The children of the lower grades would spend time to good advantage visiting parks, fields, and woods where this can be done. Visits to the museum, dairy, electric power plant, bakery, telephone company, and countless other places of interest are of value to the children of the middle and upper grades.

Exhibits of raw and manufactured products such as grains and cereals, the various stages in the manufacture of silk, the by-products of petroleum, and many others can be obtained by writing to the manufacturers. In many cases the simpler exhibits can be made by the children themselves.

Children like to do things. They take pride in exhibiting the results of their labor. Opportunity may be given them in the making of charts, graphs, drawings, and posters.

The following make interesting and instructive charts:

1. Daily health habits kept by each individual child.
2. Teeth.
3. Systems of the body.
4. Types of food.
5. Good and bad posture.
6. Weather, on which are recorded temperature, pressure, humidity, precipitation, and direction of wind.
7. The relative position of constellations.
8. The solar system.

Graphs may be made to show:

1. The decrease in the death rate due to vaccination.
2. The development of telephones.
3. Development of water power in the United States.
4. Fuels used in the United States.
5. Control of diphtheria by antitoxin.

Drawings are great aids in teaching almost every phase of science. Posters showing the development of transportation, lighting, communication; those teaching health habits; those illustrating types of homes—not only teach science, and help to maintain interest, but furnish material for art classes as well.

Pictures of the great scientists such as Pasteur, Galileo, Torricelli, Watt, Dr. Lazear, Dr. Jenner, Morse, Bell, Edison, and others, posted on the bulletin board, are also helpful.

Nor should the science scrapbook, the bulletin board, magazine advertisements, stereopticon slides, moving pictures, and science plays, be over-

looked as interest-producing devices to be used by the teacher in her science classes.

### Correlation with Other Subjects

We know from experience that if in teaching a topic, it is approached from several standpoints and its relation to other things pointed out, the results

will be more lasting than when each thing is taught as an isolated fact and no attempt is made at correlation. Religion, art, literature, language, arithmetic, geography, civics, homemaking, and even music may easily be correlated with science. The possibilities are so many and so varied that books could be written on the subject.

It is to be hoped that science teaching will begin at primary level, and will be carried through all the grades. If this is done in a scientific, purposeful, well-organized way, we may hope to develop a new type of youth, who will not only face the problems of life but will attack and solve them more intelligently and with more success.

# Biological Sciences in the High School

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IN THIS article no attempt is made to evaluate comparatively the separate courses of botany and zoology in preference to a course in biology in which the two life sciences are correlated. But it is rather a plea for a better understanding of the psychology underlying the successful teaching of any of the biological sciences, no matter under what name they may be presented.

### Teach High-School Students

In the first place the teacher must realize that a course in secondary biology is something altogether different from a course on the college level. This means that no matter how successful a college teacher may be with college students, he has no guarantee that he will have any success when he subjects high-school students to these same methods of pedagogy. And still less success is to be expected when the biological teacher merely boils down or simplifies one or more of the courses which he has taken at some university or college, probably during the summer session. A teacher of biological sciences on the secondary level can attain a fair degree of success only when he realizes that these subjects likewise call for a special pedagogy particularly adapted to this level.

No teacher of English, Latin, or mathematics would attempt to use the technique of the college instructor of these subjects. One may object that the language teacher is automatically prevented from doing so, inasmuch as these languages are taught consecutively for a number of years, and hence demand a fair degree of graded instruction. However, one must not be misled by the thought that since botany, zoology, or biology are frequently taught, at the most, for one year only, that these subjects do not lend themselves to grading. We must not forget that the subject matter of either a half or full unit of biology can be presented in a graded sequence, if we only take the trouble to do so.

A few months ago while riding in a train, I overheard a group of high-school students discussing their classes. "Oh, I hate science," said one. The tone of voice and her facial expression confirmed every word that followed. And this disgust was likewise shared by her classmates. Politeness did not permit me to make any inquiry as to the reasons. But one can easily imagine that something must be wrong. Either

**EDITOR'S NOTE.** A college teacher in this article looks at the high-school situation so far as the teaching of biological sciences is concerned and with good sense and practical suggestion records his impressions. This article cannot fail to be stimulating to teachers of science in both elementary and secondary schools.

the equipment or teaching aids of the school was insufficient or the instruction itself was poor. In fact, I was convinced that the fault was not with these pupils, inasmuch as biology was singled out for contempt.

Past experience and reports from others, have proved to me that students who show a lack of interest in most of their classes frequently show a lively

interest in life sciences when these are properly taught. In fact, I know of many instances where school authorities and teachers paid proper attention to the biological sciences with the result that these were declared to be the most interesting classes by both boys and girls. Unfortunately, it is true that a biological science is frequently a course just recently added to the curriculum and, as such, is just in its infancy in that high school.

### Equipment is Essential

What is rather discouraging is the fact that at times authorities fail to realize the particular needs of life sciences if they are to be taught with any degree of success. Many superiors wonder why biology requires a laboratory and a rather elaborate equipment, when an eraser, a piece of chalk, perhaps a protractor, a book or two is all that the teacher of this or that other subject demands. And then, too, it soon becomes apparent that not every high-school teacher may as much as merely substitute for the biology teacher for an even short period with a marked degree of success as can be done in many other subjects. The successful teaching of any of the life sciences calls for a teacher specially trained in the subject of life science as well as in the particular pedagogy or technique required in imparting this knowledge, a special laboratory properly equipped with the necessary teaching aids, and a library of select books for ready reference.

### Teaching Aids

Most teachers agree that the possession of an actual specimen of the animal or plant being studied, either for demonstratory or dissection purposes ranks first in the list of teaching aids. A picture or photograph is a poor substitute, although pictures or photographs of related forms serve to heighten the interest and enhance the instruction considerably. A Chinese proverb says: "A picture is worth ten thou-

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sand words." This is especially true if the illustration happens to be a part of a large, carefully planned chart. The size of the chart and the fact that the illustration remains for a long time before the student and can readily be referred to, does much to lessen the burden of study. At times a chart is the only means of clarifying a point difficult to understand. The market, of course, is full of biological charts, some very good, many mediocre, and quite a few rather poor. Some have been planned carefully with a definite motive in view and, as such answer a distinct need. Others are simply made to sell. No amount of caution in the choice of one's teaching aids can be overemphasized. When a poor selection is made, one not only has the misfortune of being obliged to use inferior material, but constantly hears the echo, "you already have this or that set; why spend the additional money?"

Among the teaching aids, owing to the investment involved and the possibility of damage when handled carelessly, models probably occupy the third place, although the fact that the relative position of organs in the third dimension can be readily visualized, cause some instructors to depend upon them heavily. One must not figure the original cost, but rather understand that the utility of any teaching aids if properly handled, can be spread over a long period of years, and thus can be a great timesaver both to teacher and students. In other words, if one considers the time factor from the standpoint of service, time saved, and ease produced, no well-prepared teaching aid can be considered expensive. On the other hand, a poorly prepared teaching aid is expensive at any price.

The ideal equipment accordingly, would be the actual specimen of the form studied, a chart, and if possible, a model as well, with perhaps a comprehensive collection of related actual specimens. Many a good teacher can and will dispense with some of these if for any reason, they happen to be unavailable. And the poor teacher will hardly use any of these to the best of advantage.

#### Presenting the Vocabulary

Since there is a lack of unity or standardization of the subject matter of life sciences even in the various high schools of the same city, it is difficult to prescribe a fixed set of directions. Nevertheless, the teacher of biological science must take a lesson from teachers of other subjects. Since biological sciences frequently make use of special vocabularies new to students, it is evident that the building of a scientific vocabulary is a prime factor in the arrangement or graded presentation of biological studies and facts. The premature use of new and difficult words is the leading factor in causing students to dislike a particular biological class. They may not have an aversion to a study of the science of living things, but they are repelled by poor instruction.

Yet, there are no other subjects that lend themselves so readily to be presented in a rather interesting and fascinating form as do any of the life sciences, for everybody is interested in life, at least in some phase of life.

#### How to Begin

The teacher can select from a rather extensive mass of biological information, arrange the facts in a graded sequence in such a manner that each preceding lesson is a preparation for the lessons to follow, and each consecutive lesson at least a partial review of the lessons that preceded. In other words, biological studies can be so arranged and presented that unity and uniform operation of the Creator's laws can be readily seen. It does not matter whether the teacher plans to begin his biological lesson with a study of leaves, roots, or any special group, provided the instructor is prepared to present

the facts, in an interesting, fascinating, and graded manner. However, from a psychological standpoint, much time is gained and the lessons are easier if they lead from the known to the unknown, and if function rather than form are initially emphasized. To be specific, it is better to let the student understand that a plant is something alive, a factory that does some work, and not merely a morphological unit made up of roots, leaves, stems, flowers, etc. And, accordingly, if unity is to be preserved, a definite sequence of instruction will be outlined by the careful teacher. But the science teacher must not forget that it is not necessary to present all the known facts about leaves or whatever special topics happen to be studied in the initial lessons. For this tends to destroy interest and obscure unity. We never heard of a Latin or German teacher who taught all the possible rules of syntax, relative to the first declension in the first few weeks of the class session.

In botany or any of the life sciences there is a definite sequence where special topics can be studied with a minimum expense of effort, both on the part of the teacher and student with a maximum return of the amount of interest aroused and knowledge imparted. From the standpoint of interest, a half unit of botany would precede a half unit of zoology. A reversal of this sequence would readily affect the interest aroused. Likewise certain forms, let us say certain specific leaves or flowers, are by far more suited for instruction purposes than any leaves or flowers that merely may be at hand. The same is true of animal forms. The choice must be made with a definite objective in view, not merely with a viewpoint of marking time, just studying something.

#### Some Mistakes

Very many transgressions of the rules of sound pedagogy are made in some of the courses parading under the name of biology. A perusal of some of the textbooks reveals that neither the author nor the teacher who makes use of these particular texts know what their work or duty happens to be. The old saying that a "textbook is made with a pair of shears and a glue pot" is sadly only too true in many cases. A mass of poorly assembled unorganized facts is culled from here and there, with one apparent care not to overlook any possible source. One particular textbook of biology makes use of the current magazine article, borrows from fields of ecology, physiology, entomology, psychology, neurology, cytology, genetics, and medicine, and this all on the high-school level.

Another instance is necessary to make the sad story complete; namely, that the teacher makes use of some of the test sheets offered for sale, in which the poor student is required to name some forty or more odd, minutely detailed parts of the external or internal anatomy of an earthworm, crayfish, or perch, and which, undoubtedly, the teacher expects to correct by means of a key.

No wonder some students complain: "I hate science; I hate biology!"

#### TEACH THEM TO SEEK JESUS

The child spontaneously turns toward Jesus, and as it believes in its mother and goes to her, so it goes to Jesus and believes in Him, said His Holiness Pius XI, recently in speaking to teachers.

His Holiness recalled the warning of the Redeemer against those who scandalize little ones, and concluded by inviting the teachers to direct these little souls to Jesus so they might seek in Him the fullness of sanctity and the explanation of every mystery of life and creation.

# What College Teachers of Science Expect of High-School Graduates

*Rev. Ulrich A. Hauber, Ph.D.\**

EVERY event in the life of a growing child leaves a mark, often one that produces profound and lasting effects. A man's very essence, so to speak, is largely the product of the home, church, and school environment during his formative years. The college teacher rightly expects that these agencies, and particularly the high school, have done their share in guiding development through the adolescent stages in preparation for the final stage of a college career when the student is to produce the flower and fruit of maturity.

Nor is it enough that the child's organic development; that is, the unfolding of his physical and mental powers, be wisely supervised. Man is indeed an organism composed of body and mind, but he is more than that; he is a spiritual entity. If this supreme fact has been overlooked the college may be able to do little more than develop a physical or intellectual athlete. A high-school graduate dwarfed in character and lacking in religious principles may indeed have strong vitality and give promise of vigorous growth; but the same is true of a noxious weed.

The college teacher, therefore, expects of those who come to him: first, that they were born with sufficient inherited ability; and second, that their native endowments were subjected to a school environment which permitted and encouraged normal development toward membership in a modern civilized and Christian society. Anyone who has had long experience with college freshmen will feel that very few generalizations are justified, and these only if it is understood that the reader must interpret them broadly and may never apply them blindly or by rule of thumb. High-school graduates may not be looked upon as standardized pegs that may be whittled to fit the college teacher's specifications. With this fact constantly in mind, an outline of some general principles may be attempted, cautiously, and with the help of concrete illustrations.

## Native Ability

Two boys who sat side by side in high school for four years matriculate for similar courses in college. One of them completes his freshman year with

**EDITOR'S NOTE.** Any college teacher of science, or of any other subject, can vouch for the accuracy of Father Hauber's analysis of the causes of success or failure. The high-school teacher will readily agree that the assignment given him by this author is not an impossible ideal but just common sense. He will thank the author for a sympathetic treatment of his problems. A clear analysis contributes more than anything else to the solution of a problem.

high honors; the other is dropped for poor scholarship. This is a common occurrence and investigation often reveals that the successful student had only a slightly better record in high school. Intelligence tests, however, indicate a clear-cut difference. The one who failed is much inferior with respect to native ability. Possibly he had a satisfactory record for application and industry, gave evidence of genuine good character, was a likable personality, and possessed a fine spirit of co-operation. Qualities such as these may have influenced his teachers to pad his grades. But he has not the ability to think clearly and consistently on problems that require intellectual acumen. He is a failure in college.

In the case of such a student it matters little what he was taught in high school or what methods were employed in his behalf. He is simply not cut out for a college career and the college teacher expects that he has been told just that. If he is put in the right place after high school he will develop normally into a first-class citizen. In the business world, in agriculture or industry, as a tradesman or technician, he has every opportunity to accumulate his share of this world's goods and to lead a useful and happy life; he may even command the respect of his fellow citizens more fully than many a successful college graduate. But an attempted career in college may mean shattered ambitions and a loss of self-confidence, the evil effects of which will last a lifetime.

This, then, is the first essential qualification of any student who enters college: that he has the mental endowment necessary for serious college work.

Moreover, a student who expects to major in science must have the specific

abilities necessary for scientific work. One may have talent for languages, journalism, social science, history, music, or art, and yet be quite mediocre in the mathematical and physical sciences. Frequently a freshman shows pronounced interest in mechanics, or chemistry, or entomology, and because of his evident enthusiasm in one of these directions he is encouraged to register for a major in science. As the weeks go by, however, disillusionment sets in. A lively interest and an enthusiastic approach are, of themselves, not enough; the only solid foundation upon which to build a scientific career is genuine and specific intellectual ability.

## Attitudes and Aptitudes Developed in the High School

Native ability is essential. In its absence a college career is necessarily unsuccessful. But even when present, ability serves only as the raw material from which the other essential qualities are gradually developed. Such acquired abilities are varied; we shall limit our discussion to two that are of outstanding importance; namely, a fearless attitude toward hard work, and correct habits of study.

It happens sometimes that, of two students who have equal intellectual endowments as well as similar high-school recommendations, one is successful in college, the other is not. In such cases it can often be shown that success came to him who in his younger years had formed habits of hard work. The other student who had performed his high-school tasks well but had nevertheless failed in college, was likely of the easy-going type, talented perhaps and clever, but lazy. His efforts were scattered, his motives selfish, and his interests lay outside his work. The real student has developed vital interests in things of the mind along with high ideals and unselfish enthusiasm. These qualities became fixed and later functioned as an adequate driving force when he encountered the really serious and difficult tasks of college life. Success in college, or for that matter of adult life in general, demands days and months and years of struggle with intricate details, it calls for tireless patience, a never-failing passion for rigid accuracy, an unflinching spirit of self-sacrifice. One cannot succeed unless

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one is actually in love with hard work.

One also hears the complaint about an unsatisfactory student, a complaint sometimes made by the student about himself, that he has not learned *how to study* in precollege days. Has anyone ever put in concrete form just what is meant by this indictment? If so, he probably discovered that the individual who knows how to study is precisely the one who has achieved the qualities referred to above. He is eager to learn, does not permit slovenliness in matters of detail, does not shrink from hard work; and all this because he has high ideals and unselfish motives. He has all that it takes to make a good student and it follows automatically that he knows how to study.

When one asserts, therefore, that the high-school student must develop the abstract and apparently intangible qualities described as "vital interests," "unselfish enthusiasm," "an adequate driving force," one is not speaking the language of an impractical idealist. The qualifications implied by these terms are more practical than specific and easily defined scholastic attainments. They are supremely practical because they spell love of hard work and sound habits of study.

These, then, are some of the primary requisites for success in college science. They are the motivations, attitudes, and consequent aptitudes that cannot be measured accurately by any tests. Their presence or absence is recognized and their development is encouraged only by a teacher who understands the inmost nature of men and women as well as he understands the technical facts of his own particular department in the high-school curriculum. Is the college teacher really asking too much when he expects the high-school teacher to develop in his pupils, not only intellectual skill and scholastic attainments, but also high motives, strong interests, and correct attitudes? The answer is definitely no, because the former cannot be achieved, at least on a college level, without the latter.

#### Minimum Scholastic Attainments

Given the above prerequisites of talent, character, and attitudes, there are still certain minimum requirements in purely scholastic achievements that the college teacher of science may legitimately expect of high-school graduates. The more important may be listed:

1. A command of English; that is, the ability to express one's thoughts correctly and accurately. The college teacher cannot take time out to teach grammar, spelling, and punctuation. Of

course, the lack of ability to write a correct English sentence is, in most cases, not due to a lack of efficiency in the high-school English department; but as long as that department cannot prevent its incompetents from entering college there is room for improvement.

2. A reasonable skill in elementary mathematics, including arithmetic, high-school algebra, and plane geometry. College science cannot be mastered without these prerequisites, and it is disconcerting to find every year larger and larger numbers of high-school graduates who have not been exposed to any type of mathematical training.

3. An elementary knowledge of universal history, at least in outline. When the lecturer in science who wishes to make a point by calling attention to a historical fact finds that a reference to ancient Greece, to the Roman Empire, or to the Renaissance Movement, means nothing at all to his listeners, he is more than mildly distressed. He does not expect his beginners to be familiar with the life of Hippocrates, Galen, Albert the Great, Copernicus, or Pasteur; he considers it a part of his own program to teach about these men; but he cannot possibly find time to develop the general historical background into which he must place these personages. And without such a background, training in the modern sciences tends to develop narrow, if not bigoted, specialists. The teacher of science, at least the Catholic teacher of science, feels that one whose outlook on humanity is limited to the present generation cannot successfully apply the scientific method to any problems involving human affairs.

4. An elementary acquaintance with Latin is highly desirable. German, French, or Spanish are rather poor substitutes for this international language of science.

5. Lastly, and I put this at the end of the list advisedly, an elementary knowledge of some high-school science may be helpful. A broad course in general science, a survey course if you wish, may well be compulsory in the high school; but it must be in the hands of a teacher who is competent and thorough. Beyond that, one or the other of the following sciences—by no means all of them—may be required for college entrance: physics, botany, zoology, human physiology. A high-school course should not be top-heavy in natural science, not only because that prevents adequate treatment of the other fundamental subjects named above, but apparently also for another important reason. It is a common experience that freshmen who have had four

full years of high-school training in science are often surprisingly helpless in the face of college standards. College chemistry teachers, in particular, find that frequently a "knowledge" of high-school chemistry is a handicap rather than a help in their work. Nor is this necessarily because the subjects had been poorly taught. High-school courses by their very nature in the present American school system are of necessity semipopular, largely informative, and consequently superficial. They are deliberately made "easy" so as not to repel the student. They stress wide information rather than clear thinking. Because of these characteristics they tend to build up in the student wrong concepts as to the nature of scientific work.

The high school should not attempt to erect a scientific edifice in the minds of its students, but rather to prepare an adequate foundation for a future substantial building. It is easier in education, as in building operations generally, to erect a modern edifice on a vacant lot than it is to remodel an unsatisfactory structure already there.

#### RELIGIOUS EDUCATION IN AMERICA

There were Catholic schools in America 200 years before anyone had any notion of such a thing as a public school, says Rev. Harold E. Keller, diocesan superintendent at Harrisburg, Pa., writing for the N.C.W.C. news service.

The earliest schools were founded by Franciscan priests in Florida and New Mexico. In the latter territory, younger children were taught reading, writing, catechism, singing, and music. Older children specialized in industry—tailoring, shoemaking, woodcarving, stonecutting, smithing, and brickmaking. In Lower California, the Jesuits taught Christian doctrine, reading, writing, music, and trades—farming, carpentry, smithing, and brickmaking. The Capuchins came to New Orleans in 1722 and started a church and a parish school. On February 22, 1727 (five years before George Washington was born) 10 Ursuline Sisters sailed from France to open a school in New Orleans.

"Practically all the schools set up in the English colonies as well as those of the French and Spanish colonies prior to 1800," says Father Keller, "were religious schools. To the minds of the colonists—Protestants and Catholics—religious instruction was the first duty the school owed its pupils."

After citing the opinions and actions of William Penn, George Washington, and Thomas Jefferson as favorable to religious education, Father Keller says: "One hundred years ago everyone had come to associate education with the Church. . . . It is only within the past 35 or 40 years that public education has really become secular." He then quotes Warden Lawes of Sing Sing who says: "Less than one half of one per cent of the inmates of Sing Sing ever had any contact with any religious, fraternal, or boys-club program in their youth."

# Newest in High-School Chemistry

## Semimicro Laboratory Methods

William J. Schiller, Ph.D., and Sister M. Lawrence, R.S.M., M.S.

AT THE present time, due to limited equipment, laboratory space, and finances, many high schools find themselves at a decided disadvantage when it comes to laboratory instruction in chemistry. Because of the disadvantages the students are given too few experiments or the instructor finds it necessary to perform the experiments which should be carried out by the students. In addition many of the tests are dangerous in character, and sometimes they lead to disastrous results. With these points in mind, the writers of this article have sought ways and means of overcoming the disadvantages.

The panacea for these ills, they believe, is to be found in the application of the so-called semimicro methods to the high-school chemistry laboratory. These new procedures offer many decided advantages over the older large-scale methods. After having worked with semimicro chemistry for the past two years and having been instrumental in its introduction into other schools, the writers feel that their own experience justifies the enthusiasm with which they advocate its adoption.

To many, the use of the term *semimicro* will be meaningless. As generally used the term *microchemistry* refers to the use of the microscope as applied to chemistry. We have used semimicro to mean the application of small-scale apparatus and the use of small amounts of materials to the carrying out of experiments. We might say that we are looking at the regular setups and procedures through the object lenses of a field glass instead of looking through the eyepieces. In the long run, semi-microchemistry endeavors to reduce the regular chemical procedures to a much smaller scale.

With these preliminary remarks we shall include what we consider the outstanding points in favor of the semimicro method.

1. A specially built laboratory with desks and sinks is not necessary. Any room, well lighted and well ventilated of course, with gas connections will answer. If gas is not available, alcohol lamps will be found adequate. Sinks may be substituted by pans or other receptacles for the small quantities of waste liquids. Any type of small desk will give adequate working space. Hood facilities are unnecessary because insufficient amounts of noxious substances find their way into the air.

2. Lockers are not necessary because equipment can be kept in a cigar box or other small container; and these, together with the reagent blocks which measure 9 inches by 10 inches and which contain practically all the solid and liquid reagents required during the course can be kept on shelves.

3. Corrosive reagents such as sulfuric and nitric acids are kept in 30 cc. dropping bottles. When using these, the student works with drops, thereby lessening the danger involved.

4. The danger from poisonous gases, flammable gases, and explosive substances is reduced to a minimum. Certainly when only 8 cc. of a gas such as hydrogen or chlorine is collected for an experiment, the hazard involved is less than that incurred when about 250 cc. is collected; or the mixing of a few crystals of substances as potassium chlorate with other materials will give less anxiety than the mixing of grams of such materials. In fact, the danger element is reduced to

such a point that even the most timid student works without fear.

5. The student may remain seated while performing the experiments. This cuts down the "chasing around" which is often prevalent, and permits the student to observe the experiment more calmly.

6. An outstanding advantage is the low cost involved. As this statement we know will be given close scrutiny, we are prepared to enlarge upon the point by giving specific data. The semimicro method was installed at St. Casimir's High School, Pittsburgh, Pa., at the beginning of the 1936 school term. The laboratory was a room 12 by 36 ft., and it was necessary to take care of twenty students. The total cost of the chemicals, mainly in quarter-pound lots, was \$46.68; the cost of the apparatus was \$178.49, making the total cost for equipping the laboratory \$225.17. It must be remembered that this is an initial cost and that expenses for the future would be very small.

7. The semimicro method is speedier; therefore, more experiments may be included.

8. It is not necessary for the students to work in groups. Each student works independently.

9. Many experiments of a quantitative nature can be carried out because each pair of students is furnished with an inexpensive horn-pan balance and a small set of weights. These have been found to give good results.

10. The student acquires a greater familiarity with the chemicals as they are in front of him and at his disposal at all times. As noted above, practically all the reagents are placed in small vials and dropping bottles in a single reagent block; each pair of students has one of these blocks.

The following brief list will give a general idea of the type of equipment and the technique involved in semimicro methods:

**Test Tubes:** Fermentation tubes of 2 cc. capacity are used. Where very small amounts of materials are involved short lengths of ordinary glass tubing sealed at one end may be used.

**Burners:** Special micro burners may be purchased, or ordinary Bunsen burners of the pilot-light type, which may be converted to micro burners by unscrewing the tubes, may be used. If gas is not available, alcohol lamps can be utilized.

**Vials:** These are made of glass and are 21 mm. x 20 mm. Solid reagents are kept in these, and they are used instead of 8-oz. wide-mouth bottles for collecting gases.

**Glass Microscope Slides:** Precipitations, filtrations, decantations, and color reactions are carried out on these.

**Spot Plates:** Porcelain plates with slight depressions or concavities, either in black or white porcelain. These are useful for precipitations or color reactions.

**Centrifuge:** Hand centrifuges for rapid separation of precipitates. These are detachable and are fastened to the desk tops. Their use makes funnels and filter papers unnecessary.

**Centrifuge Tubes:** Pyrex glass tubes of 2 cc. to 3 cc. capacity for the centrifuge.

**Dropping Vials:** Used for liquid reagents and holding approximately 8 cc. They are equipped with screw caps made of bakelite, and can be kept in drilled reagent blocks.

**Reagent Bottles:** Of 30 cc. capacity equipped with ground-

in glass pipettes or with rubber stoppers. Concentrated acids and bases are kept in these.

**Reagent Blocks:** The vials with solid and liquid reagents are kept in these blocks. Their size is dependent upon the number of reagents required. In a college course the size of the block for the liquid and solid reagents is 9 inches by 10 inches; it contains 16 holes for liquid reagents and 120 holes for solids and test tubes.

A brief description of some of the principal methods will give a clearer insight into the technique of this method.

**Precipitation:** This process is carried out by combining a drop of precipitant and one of the solution to be precipitated on a glass microscope slide, on a spot plate, or in a test tube.

**Filtration:** (a) This process may be carried out on a glass slide by using a medicine dropper and a piece of cotton. The cotton is placed at the edge of the solution, and the opening of the dropper, with the bulb compressed, is pressed down on the cotton. The pressure on the bulb is slowly released and the cotton pushed through the solution and against the precipitate in such a way as to encircle it. The solution is thus filtered through the cotton and the precipitate is left on the slide.

(b) Filtrations are rapidly and effectively accomplished by centrifuging.

**Evaporation:** Liquids are evaporated by gently warming the drops of liquids on glass slides, on small watch glasses,

or in crucibles which serve as evaporating dishes.

Typical directions, as used by the class at Our Lady of Mercy Academy and involving some of the apparatus and methods described above, are here given.

"Hydrogen is generated in a small test tube using a setup such as used for the preparation of oxygen from potassium chlorate and manganese dioxide. A few pieces of mossy zinc and 5 cc. of hydrochloric acid are used and the gas is collected in 8 cc. vials by displacement of water. The gas in the vials gives excellent tests for combustion and diffusion, and there is no danger of an explosion."

We hope that the foregoing will give some idea of the scope of semi-microchemistry. We hope also that we have imparted some of our enthusiasm to those interested in chemistry. To those who would like to adopt the method we say that the technique is readily acquired, and that there need be no hesitation on this score. In fact, it is a lot of fun to work with this method. The teacher will also find that the student will often acquire enough enthusiasm to desire to build a set of his own. Again it must be emphasized that this method is finding increased use in college and commercial laboratories so that one who is dealing with the semimicro method is at the same time in the forefront of chemical advance.

The authors of this paper will welcome comments or inquiries. They will gladly extend any help which they can to those desiring added information on semimicro methods.

## The High-School Science Laboratory

A. C. Monahan, Ph.D.

THE Boston High School for Boys, opened in 1821, is generally credited with being the first public high school in the United States. In its original course of study, sciences were included, natural philosophy being a required subject for all fourth-year students. Three years later it was required for all second-year pupils, and experimental lectures in natural philosophy were required in the fourth year. Since then practically all high schools established offered courses in natural philosophy, and later in chemistry and botany, and then in other science subjects. Private academies prior to 1821

gave science courses, but as these institutions were almost exclusively college preparatory schools, and colleges gave no credit for admission to science courses, the courses occupied a minor place in the curriculum.

It was not until 1870 that colleges began to accept science courses for admission. Almost immediately the sciences assumed an important place in the high-school course of study. In the next two or three decades at least twelve different subjects were included in various sciences offered, and by the end of the century approximately one half of all high-school pupils were enrolled

in one or more science subjects. By this time also the laboratory method of teaching was becoming regarded as essential, and the number of different subjects becoming more limited because of the popularity of the courses where instruction was given through the laboratory.

At the present time, the "typical" high school may be said to be giving four subject courses—general science in the first year, biology in the second year, chemistry in the third year, and physics in the fourth year. In many high schools the order of the last two mentioned is reversed. Many of the



Biology Laboratory, Bolton High School, Alexandria, La.



Biology Laboratory, State Normal School, Cortland, N. Y.

larger schools are giving an optional second year in biology, chemistry, and physics. Rural high schools in large numbers are giving courses in agricultural science and in the household sciences. The tendency in instruction in these subjects is toward practical work through the so-called "project method" carried out at the school or at the home, with either indoor or outdoor work, and emphasizing in their courses in biology, chemistry, and physics the subject matter which has the most direct bearing on scientific agriculture and the household sciences.

In reviewing the teaching of the sciences in secondary schools, and in colleges as well, it is noted that the subjects demanded by all concerned are the laboratory subjects taught through the individual-student experiment method. Textbook courses have disappeared almost wholly, as have former courses made up largely of textbook work plus demonstrations before a class by the instructor. Some demonstration work is still necessary, but the amount is limited to the kinds of demonstrations that individuals cannot make for themselves because of danger to the student, cost of the apparatus necessary, or other reasons evident to the science teacher. This means that the school must have satisfactory laboratories if its science teaching is to be modern and effective, and, incidentally, if its work is to be accepted by colleges for entrance requirements.

In any high school the number of laboratories necessary is an important consideration, as well as is the type of furniture and the apparatus and equipment. Ordinarily, a single laboratory may be used by two separate classes a day, and by only two. Laboratory periods are double periods. Two classes each day means the room is in use for scheduled groups two thirds of the school day. To schedule a third class results in confusion in the use of space and equipment, and it interferes with the use of the room by individuals who need to repeat exercises or do extra work beyond the required program.

One may assume the "typical" four-year high school to have an enrollment of from 200 to 250 pupils. It would have 60 per cent of its students enrolled in the various science classes, according to the U. S. Bureau of Education. It would have at least two groups in general science, two in biology, two in chemistry, and one or two in physics. If it follows what seems to be more and more a general practice, it will require all first-year pupils to take general science and would have, therefore, at least three



*Physics Laboratory, Bolton High School, Alexandria, La.*

groups each day in that subject. For such a school, four separate laboratories are needed and one general lecture or demonstration room which may, of course, be used by other classes when not needed for science groups. Such lecture-demonstration rooms are not necessary where the Lincoln type of furniture is used, as this furniture, developed by the Lincoln School, Columbia University, New York City, permits the laboratory itself to be the lecture-demonstration room.

Smaller schools may use combination laboratories. Physics and chemistry classes may use the same room equipped with chemistry tables, if arrangements are provided on the tables for removable uprights. General science and biology may use the same room if the number of pupils is small enough, because the same type of furniture is suitable to these two subjects.

The most commonly used type of furniture for general science is the two-student table, approximately 72 inches in length and 24 inches in width, at which the pupils work side by side facing the same direction. The table is 30 inches high and may be used for both standing and sitting work. Each student has an individual drawer under the table. If the laboratory is used by many pupils, the tables should be equipped with a chest of drawers under the center. Longer tables for four pupils, six or eight pupils are satisfactory, but are not as convenient for the instruction in looking over the pupil's work as the two-student table with aisle space, between the adjoining tables in the same row. In many schools four-student tables are used, double width with two pupils on each side. It is a satisfactory

arrangement but leaves the room less satisfactory for demonstration work by the instructor as all pupils are not facing in one direction as in the first arrangement suggested.

Illustrations accompanying this article show laboratories equipped with the three arrangements mentioned and the various types of tables in most common use.

The general-science laboratory, in addition to the student work tables, should have a demonstration table for the instructor. This should be approximately 6 ft. in length and 36 in. high so that demonstrations may be more easily seen by the pupils. It should contain a sink, running water, electricity, and gas. Student tables in general science do not as a rule require running water, sinks, or gas. The laboratory should have an aquarium with glass sides, a wide shelf under the windows for germinating beds for planting specimens and watching seed germination and plant growth, cabinets for museum specimens, cabinets for apparatus, one manual-training or work table, and light bent-wood chairs for the pupils. One wall sink for the student's use is essential.

The biology laboratory, in general, is equipped with the same type of furniture as the general-science laboratory. An additional cabinet is necessary for microscopes, as they should always be kept separated from other equipment and supplies, particularly if the supplies include any chemicals. More wall sinks for general use are desirable than in the general-science laboratory.

For the chemistry laboratory, for a class of 24 pupils, the maximum number one instructor can handle efficiently, a



*Biology Laboratory, Lincoln School, Teachers College, Columbia University*

room 22 by 32 ft. is required, but a room 24 by 38 ft. is more desirable. This permits the use of three double student tables, 3 ft. high, 12 ft. in length and 4 ft. in width, placed crosswise with the room. This gives the best arrangement for lighting and gives ample room for cabinets, fume hoods, and balance shelves on the inner wall of the room. The illustration shows a standard double desk 12 ft. long for 16 pupils in two sections. Each student has a cupboard and one large drawer. A trough runs the length of the desk to an end sink. The desk may be equipped with two center sinks without the trough, each for four pupils, if desired. Water and gas are provided in open plumbing under the reagent-bottle shelf and electricity may be had if desired. Many variations of this form are in use, but on a whole, this type is probably the most satisfactory.

The laboratory table tops in high schools usually are wood with an acid-resisting finish. Wisconsin hard birch is used. The tops are made of three- or four-inch strips, tongued and grooved and glued together in one solid piece. The tops are from 1½ in. to 2 in. in thickness and are made by the best manufacturers of laboratory furniture, in one piece up to 36 ft. in length. The tops are practically nonwarping and give a rigidity not to be secured in any other way. They are planed and sanded to a smooth finish, treated on the underside with a moisture- and acid-resisting lead paint, and on the top with a standard acid-resisting treatment which leaves them with a black velvety sur-

face. Soapstone and other tops are also used, but on the whole, for high schools the wood top has proved most satisfactory. For colleges the relative values of wood, soapstone, and other tops should be given careful consideration, the decision resting upon the type of chemical work to be carried on in the particular laboratory.

The same type of built-up tops with the same acid-resisting finish should be demanded on all student laboratory tables whether used in general science, biology, physics, or chemistry. This type top is also desirable for lecture tables, balance shelves, and for shelving in chemical storage cabinets, and stone or similar tops for high-school chemistry fume hoods.

The student table most commonly used in the physics laboratory is a four-student table 30-in. high and approximately 6 ft. by 3½ ft. in size. This gives each student a corner to himself, and it permits two or even four students to work together on the same experiment as is often desirable or necessary. Each table is equipped with gas and electricity, but no sink. Outlets for gas and electricity are placed on the sides on the end rails to leave the top clear for all work. Tables are equipped with removable uprights and crossbars, made either of wood or metal.

The physics laboratory should have two wall sinks for student use, cabinets for storage of apparatus and equipment, a shelf for weighing scales, and if possible a single manual-training table with a vise and a few simple tools.

Mention has been made of the best

materials for table tops. For all cabinet and other parts, hard northern oak has proved the most satisfactory. It requires a smooth finish and from three to four coats of the best varnish after filling and staining, to resist the peculiar destructive agencies in the laboratory. It should be remembered that little furniture is subjected to the hard usage of that in the laboratory from the standpoint of chemical fumes, peculiar moisture conditions, and rough student use. Therefore, well-built furniture is essential, and that constructed by standard laboratory furniture factories in the long run is more satisfactory and cheaper than any other.



#### CATHOLIC EDUCATION MILITANT

These teachers are to lead children to Christ in a world in which powerful forces are at work to destroy every vestige of faith in the things above. They must exemplify in their lives and show forth in their teaching the fact that there is a God in heaven, a Divine Providence over creation, a spiritual soul in the human being, and an eternity beyond the grave to children upon whom every influence is being brought to bear to convince them that there is no God, that physical, visible matter is the sum total of existence, that the human being is a soulless unit produced by the chemical forces of nature and that the grave is the end of existence.

This struggle between materialism and Faith is as old as the human race and yet never in history have such powerful forces been at work as are exerting themselves at present to drag men down to the level of material things and to eliminate the truths of God from the minds of men.

In some countries this struggle has resulted in bloodshed and bitter oppression. The dominant party in Germany, Russia, Mexico, and Spain stand as champions today of the mere animal theory of the human being and are using unbelievable cruelty and tyranny to force their degrading theory on the populace. In these lands the groups in power have seized the schools and means of education and are using them to mold a generation which will have deserted God and cast aside all faith in the spiritual character of men.

In the United States the materialistic group has not yet come into the ascendancy, but nevertheless we should bear in mind that it is a well-defined group and allowed to assume power, would not hesitate to employ the same methods as those used in Germany and Russia to eradicate all opposition.

One hundred years ago, Horace Mann sponsored the first move in the secularization of American education. Since that time, one of the most notable trends in American life has been the growing appalling ignorance regarding religion, the neglect of all philosophy, the loss of faith in God and in the spiritual character of man, and the gradual materialistic interpretation of human life.

\* \* \*

You must match weapons with them in the protection of sacred truth and the salvation of the little one whom the Saviour loved.

With their materialism you must match the beauty of the spiritual; with their atheism you must match the beauty and mercy of God; with their materialistic concept of the human being you must match the dignity and spiritual character of the human soul; with their behavioristic interpretation of conduct you must match the God-given gifts of intelligence and freedom; with their variable standards of truth and morality you must match the justice and benignity of the revealed and natural laws of God.—*Rev. Msgr. F. J. Macelwane* (Graduation, Sisters College, Cleveland, Ohio).

# Aviation: A Conveyor of Lesson Material

Sister M. Gabriel, O.P.

THE keen teacher on the lookout for a good conveyor may select aviation as the medium and use it in preparing and presenting lesson material.<sup>1</sup>

But aviation is no longer a choice. Educators must become air minded to cope with interests which fascinate the mind of the child. Aviation as a curriculum subject cannot be introduced into the primary and intermediate grades for there are no textbooks (as yet) for these younger people. Aviation must be correlated with reading, spelling, art, arithmetic, geography, history, English, and religion.

On the part of the teacher, considerable study is required to equal the aviation knowledge of many of her pupils. To obtain an estimate of what experts consider to be the aviation understanding of book-loving children, read *Transport Airplanes and All About Them* by Charles H. Blodgett.<sup>2</sup> In this juvenile Mal B. Freeburg, famous pilot, conducts Bo Law to the large airports and airlines of the country and tells him about transport planes. Bo Law, judged by the several photographs of him, is under twelve years of age, but he represents any boy visiting these places of interest. The foreword is a letter to Bo from Captain Eddie Rickenbacker, vice-president of the Eastern Air Lines; it outlines all that Bo should observe: clean-cut, healthy pilots; different types of airplanes; maintenance shops; precision workmanship; magnifying glasses used in checking materials and workmanship; weather stations; balloon runs; air tickers; upper-air reports handed to all pilots before flight; radio rooms; dispatching of passenger-mail-express transport planes; names of ships and pilots.

Bo is then shown the "sock" which shows wind direction. Then he is given "inside" information on how a pilot uses the more than fifty instruments of the Lockheed Electra. He listens in on the two-way radio, and goes behind the scenes to the fully equipped radio repair shop where he sees apparatus that is "bewildering to most people," and tools that "are exciting to see."

Next Bo visits the traffic-control tower in Chicago and learns about the

eight runways, and the red and green lights. With a mechanic he inspects the landing lights. With other mechanics he sees how the rudder is inspected, also the engines, radio, and the motors, and is shown the chart of all formalities which must be signed "Plane Accepted" before the plane is allowed clearance from port.

This is half of the book. The next half is about supercharged motors, controllable-pitch propeller (or "prop"), the man-made moon, the dot-dash—dash-dot radio system, the airway radio fences which makes night flying safe, the theodolite, and other instruments. Bo learns many new terms as "set down," "wind aloft," "zero zero," and that fog is called "soup."

And this book is supplementary to the acquired knowledge of many a small boy. Before a teacher can ask for a model airplane to be brought to the classroom for examination and demonstration she must study diagrams, and know many terms—with their definitions and applications.

This is a small list. Fuselage, wing, tailwheel, rudder, motor, elevator, aileron, fin (tail fin, skid fin, etc.), stabilizer landing gear (boat, float, wheel, skid, and ski type, with combinations), control stick, nose, dive, dope. Monoplane, multiplane, biplane, glider, "clipper," amphibian, bomber, helicopter, autogiro, ornithopter, and special. Dials: compass, altimeter, air-speed meter, tachometer. The indicators, switches, gauges, and controls. That wire may mean a cable, and a scoop ventilation. "Blind" flying.

Many teachers will say, "Boys are intensely interested in aviation but the girls are not." Lieutenant Horace S. Mazet says: "For girls, too, there has been a pronounced swing toward the feminine fliers, which means that if your children are normal, healthy Americans they have been, are, or soon will be pestering you for permission to fly."<sup>3</sup> Snapshots taken of the spectators on the fences of the landing fields show as many girls as boys. This is not occasional, but an everyday scene. "Flying will always remain magic," are Anne Morrow Lindbergh's closing words of *North to the Orient*.

To orientate this subject requires all the ingenuity the teacher is gifted with.

There is little "ready-to-wear" material for her to use. But there are "helps." The magazines give the latest news on aviation, often illustrated. The story magazines have, usually, one airplane story in every issue, and these stories are thrillers. *The Catholic Boy* has excellent stories of the air, well illustrated by Roman Baltes. These stories are acceptable for class reading and analysis. Familiarity with the aircraft terms used in these stories will soon give the children a ready vocabulary and scientific knowledge.

"Co-Pilots" by M. E. Oliver in the September issue of *The Catholic Boy* gives the atmosphere of a flyer's life and the heroism to which he is called. It also teaches about the emergency patrol.

## Primary Grades

These grades should have copies of *The Story Book of Wheels, Ships, Trains, and Aircraft*, by Maud and Miska Pitersham. The colored pictures will enchant the children. Stories can be made up by the teacher and the children to dramatize the picture. With the picture of the aircraft carrier before them the children will enjoy retelling Anne Morrow Lindbergh's "Into the Yangtze." (XXI of *North to the Orient*.) Other stories may be culled from the same book.

Airplanes in group formation is a good method for the teaching of arithmetic. It also teaches correct line movement for marching. The parachutes page is entertaining. A toy parachute may be made from a piece of cloth and a weight such as a top. Attach the top to the four corners of the cloth by means of strings. Throw the parachute into the air. Explain why it comes down more slowly than the top thrown into the air without a cloth. Use similar weights. The children can be taught to construct gliders and learn how to throw them. Diagrams on the covers of aviation books are so simple that children can draw them from memory. This will lead up to the drawing of airplanes in proportion and perspective.

## Intermediate Grades

The model airplane is a boy's invention. Out of the ingenuity of thousands of boys the world over has come the present development of the model airplane. It has become the most popular

<sup>1</sup>Vocational Educational Bulletin No. 185, "Aviation in the Public Schools," Robert W. Hambrook—Government Printing Office, Washington, D. C.

<sup>2</sup>The Saalfield Publishing Company, Publishers for the Children (1934).

<sup>3</sup>"Has Flying a Future for Youth?" *Parents' Magazine*, May, 1933.

of boys' sports. From this hobby have come the model airplane clubs, tournaments, meets, exhibitions, contests, and entertainments.

Construction of model airplanes increases interest in mathematics. It is the practical application of geometry, arithmetic, and physics, plus skill. For this reason, the schools that offer aviation as an independent subject do not give it until the eleventh year. The general high-school aviation course is not intended to develop particular skills in aviation, but to provide information leading to a better understanding and appreciation of aviation.

### School Clubs

Every school should have a model-airplane club. Unless the teachers manifest an interest in this pursuit the boys will go elsewhere. If the school cannot furnish opportunities, the commercial organizations, unguided social groups, and other competing institutions will offer some sort of dynamic world to the boys and girls that will make them disregard school. Older boys who have made model planes can give the younger boys instructions. Aviators may be invited to give talks to the club. Visits should be made to airports, and full reports written. There should be exhibits and demonstrations.

For model airplanes good textbooks can be found. *The Boys' Book of Model Airplanes* by Francis A. Collins is a good one.

The financing for the path-blazing "hops" is, in great part, obtained from

the philatelists who pay well for post-marked letters. Most boys are stamp collectors. Philately and aviation are adjunctive.

The girls would desire an aviation project for themselves. For them there should be a scrapbook club. They should make a catalogue of pictures of everything pertaining to aviation, and label them neatly. Many of these pictures could be drawn or painted. The girls should have a part in all the boys' club activities. If any girl has taken an airplane trip the experience should be told to the club.

### Glossaries

The pupils should have easy access to books on the elements of aviation, with glossaries; but as the subject is advancing by gigantic progress the pupils should make their own glossaries, revising them monthly.

"... men the workers, ever reaping something new:  
That which they have done but earnest of the things that they shall do."<sup>4</sup>

The "march of mind" is doubling the speed, safety, and convenience of air travel. The half year of 1937 has brought a record of achievements that "shake mankind." Books are so soon outdated we must depend upon periodicals for information. The school should have a special bulletin board for "air news" and all the articles should be carefully filed away for reference.

<sup>4</sup>*Locksley Hall*, Tennyson.

"Attention" notices of outstanding articles should be made by regulation.

### School Library

The school library should have *We* by Charles A. Lindbergh, *North to the Orient* by Anne Morrow Lindbergh, and other standard books relating to aircraft experiences. It should also have a history of aeronautics, and biographies of aviators. Also some good fiction, and poetry.

### "O Thou Wondrous Mother Age!"

Every pupil should become familiar with the *scientific* lines of Tennyson's *Locksley Hall*, so frequently quoted as prophetic. The admiration and enthusiasm for the "fairy tales of science" expresses our own wonderment, and we too see in vision:

"... the heavens fill with commerce, argosies of magic sails;  
Pilots of the purple twilight,  
dropping down with costly bales."

Not only should the children be interested in the present progress of aviation but they must "dip into the future." The children of today are to be the scientists and inventors of tomorrow. The giant floating seadromes on which planes crossing the ocean can land in case of emergency are still in the imagination as are many of the signal devices, different motors, different wings, and new kinds of fuels. And there is yet the unexplored stratosphere.

## Some Catholic Aspects of Science and of Science Teaching *Brother Eugene A. Paulin, S.M., Ph.D.*

THINKING again the thoughts of God," is a characterization of science that has always appealed to Catholics. In itself, however, science is neither theistic nor atheistic. Science is simply a method of procedure, a way of thinking, by means of which *facts* concerning the material universe are sought, and the laws underlying them are inductively evolved. It endeavors to draw a clear-cut distinction between what can be held because of the reliable evidences or data on which it is based, and what is held on the grounds of feeling, temperament, tradition, and prejudice. The evidences for that which can be held must be beyond question, which means that they must be impersonal, public, or universal data, or, in other words,

that they be objective, measurable, and causal. Since science is based upon reliable evidences the scientist as scientist must keep within his evidences in all his conclusions, realizing, however, that they are merely tentative and that later research may call for modifications. Since science is reliable, it does not call for defenses, arguments, justifications, denials, or affirmations. It stands on its own merits.

### Inadequacy of Science Alone

The pure scientist, however, is a mere figment. We all have aspirations which no amount of experimental science can satisfy. Philosophy and religion alone can find and give *meaning* to our existence as well as to that of the universe;

and it is precisely here that the cleavage between religious and irreligious searches for truth becomes evident.

To the religious-minded, an atheistic scientist is a phenomenon more difficult to explain than the energy levels in a Bohr atom. That he can be brought face to face with universal law without seeing the need of a Lawmaker, or see the beautiful interplay of forces without becoming aware of a "far-off divine event toward which creation moves," must be put down as one of the perversities of human nature. That such perverts really do exist is one of the stubborn facts with which we must contend. Not satisfied with their own irreligious attitude, they resent the religious interpretations of others. An example in point is an

article by Dr. Max Schoen, appearing in the October, 1936, issue of the *Scientific Monthly*. After a tirade against Edgington, Jeans, Millikan, and Arthur Compton, who dared to find evidences of a divine plan in nature, he adds: "These men, speaking as scientists for philosophy and religion are neither scientists nor philosophers nor religious thinkers. They are only theologians with a vengeance; for the theologian does not claim to speak as a scientist, but uses science as a prop whenever he can do so conveniently, while our scientists talk theology, and poor theology at that, as scientists in the name of science, to produce the impression that their theology is science. The result is that, whereas the theologian of old was an open menace to science by trying to dictate to the scientist what he should or should not find in his investigations, the theological-minded scientist of today is a lurking menace, in that he poses as a scientist in his theology and gives the theologian alleged scientific grounds for returning to his old practice of meddling in science."<sup>1</sup>

#### The Catholic Church and Science

Another favorite libel of men who are scientists by profession is that religion, the Catholic Church in particular, is opposed to science. This accusation has persisted throughout the ages, and rises phoenix-like from its ashes after every death. In 1931 two professors, Dr. Harvey C. Lehman of Ohio University and Dr. Paul A. Witty of Northwestern, renewed the old accusation and proved it to their satisfaction. After ascertaining the religious affiliations of the scientists mentioned in *Who's Who in America*, the professors observe: "Noticeable indeed is the small frequency of Roman Catholics among the starred names in *American Men of Science*. Among 1,189 outstanding scientists, three only report membership in the Catholic Church." As this statement is factual, no objection can be made to it, except that of the lion in Cardinal Newman's *Lecture on the Present Position of Catholics in England*: "Lions would have fared better had lions been the artists." But their concluding remark that "the conspicuous dearth of scientists among the Catholics suggests that the tenets of that church are not consonant with scientific endeavor,"<sup>2</sup> certainly bears the palm for gratuitousness. Volumes upon volumes have been written in refutation of this assumption, but prejudice is impenetrable and the phoenix rises again.

<sup>1</sup>*Scientific Monthly*, October, 1936, p. 358.

<sup>2</sup>*Scientific Eminence and Church Membership*, *Scientific Monthly*, December, 1931, p. 544.

In our teaching of science in Catholic schools we should not hesitate to point out the contributions to science made by the members of our Church. Copious information can be found in the *Catholic Encyclopedia* and in the books by Dr. James J. Walsh and by Fathers Zahm and Brennan. Every time we use the electric units, ampere, volt, coulomb, we name eminent Catholics. Hundreds of our coreligionists have made notable contributions to the various fields of science: Galileo, Copernicus, Pascal, Descartes, Cuvier, Lavoisier, Gramme, Jussieu, Claude Bernard, l'Abbé Breuil, l'Abbé Haüy, l'Abbé Mendel, Fresnel, Pasteur, Fabre, Becquerel, Curie, Marconi, l'Abbé Lemaitre, to mention but a few. The Catholic Church has ever encouraged science, and the popes have been its greatest patrons. Even the much maligned Scholastic system contributed its share to the advance of science, a fact that is attested by no less an authority than A. N. Whitehead, in his *Science and the Modern World*: "The philosophic rationalism of the Schoolmen arose from and fitted into a general ordered scheme of thought, and prepared for science the belief that every detailed occurrence can be correlated with its antecedents in a perfectly definite manner, exemplifying general principles. Without this belief the incredible labors of scientists would be without hope. . . . The habit remained after the philosophy had been repudiated, the priceless habit of looking for an exact point and of sticking to it when found."<sup>3</sup>

#### Errors in Science Teaching

In order that science teaching produce proper results, it must avoid the following mistakes that seem to be all too prevalent:

1. First of all, verbalism and rote-memory methods must be avoided. About classes afflicted with such procedures, Horace Mann remarks: "the most glib recitation becomes the best, and the less the scholars are delayed by thought the faster they can prate, as a mill clacks quicker when there is no grist in the hopper." Because the vocabulary of science is to a great extent new for the pupils, the danger of meaningless recitations becomes all the greater.

2. Intellectualism or a lopsided purely mental education is to be avoided. Experiments, demonstrations, practical problems, should be the order of the day, and the thesis approach avoided. In other words the method of

science is induction not deduction.

3. The sciences should not be studied apart from life and life interests. Applications of scientific principles should be pointed out to the students and they should be encouraged to find others of their own.

4. Slavish insistence upon the textbook should likewise be avoided. The best way to prevent formalism is to reorganize the material in units such as the Morrison plan requires. This will oblige the teacher to freshen up the material and will animate it with new interest. (Excellent aid in this organization can be had in the book published by the North Central Association, entitled *High School Curriculum Reorganization*, Chapters X, XI, XII, and XIII.)

#### Cultural Values of Science

That science and the results of science have cultural values, would scarcely be denied; but that conveniences and luxuries contributed by modern science be taken as the only criteria of cultural levels can hardly be conceded. This, however, was precisely the contention made by Professor Newton Edwards at the Institute for Administrative Officers of Higher Institutions, held last July at the University of Chicago.<sup>4</sup> In a plea for federal aid in education he determined the degree of literacy and the degree of education in various sections of the country by the number of telephones, automobiles, radios, and incomes of more than \$1,000. According to this norm, religious, with the vow of poverty, are still groping hopelessly in the Stygian gloom of barbarism.

Among the cultural values of the study of science might be enumerated:

1. It develops the powers of observation so that the world takes on new lights.

2. It encourages healthy thought. Facts, observations, experiments are synthesized under appropriate laws and principles, and the relation of effect and cause is stressed.

3. It arouses sentiments of wonder and admiration by the discovery of beauty and order in nature, and makes this world a much better place to live in.

4. It incites attention and respect for life and for all living creatures, teaching sympathy and the avoidance of all wanton cruelty.

5. It teaches the correct approach to practical problems in the economics of

<sup>4</sup>This lecture will appear in *Current Issues in Higher Education*. The University of Chicago Press, ready in Fall, 1937.

<sup>3</sup>A. N. Whitehead, *Science and the Modern World*, pp. 11, 15.

the home, of the nation, and of the world.

6. It teaches understanding and appreciation of human life and fosters care of health and well-being. This cultural effect of the study of science must be emphasized more in the future. Dr. Carrel in his wonderful book, *Man, the Unknown*, deploras our backwardness in the sciences of life. "Man should be the measure of all. On the contrary he is a stranger in the world he has created. He has been incapable of organizing this world for himself, because he did not possess a practical knowledge of his own nature. Thus, the enormous advance gained by the sciences of inanimate matter over those of living things is one of the greatest catastrophes ever suffered by humanity. The environment born of our intelligence and our inventions, is adjusted neither to our stature nor to our shape. We are unhappy. We degenerate morally and mentally. The groups and the nations in which industrial civilization has attained its highest development are precisely those which are becoming weaker, and whose return to barbarism is the most rapid. But they do not realize it. They are without protection against the hostile surroundings that science has built around them. In truth our civilization, like those preceding it, has created certain conditions of existence which, for reasons still obscure, render life itself impossible. The anxiety and the woes of the inhabitants of the modern city arise from their political, economic, and social institutions, but above all from their own weakness. We are the victims of the backwardness of the sciences of life over those of matter."<sup>5</sup>

7. It shows how scientific problems appear not only in the life of the individual but in that of the community as well, thus encouraging civic interests. The Boulder Dam, TVA, and other projects, for example, have caused enlarged vision in the matter of co-operation.

8. It frees from superstitions and prejudices. An understanding of the fundamental principles of science and an acquisition of the scientific mode of the thought, will be guides through the maze of conflicting ideas in world politics, and will assure the formation of independent opinions, unaffected by thoughtless and groundless popular theories.

9. It should lead to God. The more profound the study of the forces of nature, the deeper will become the conviction that there is a single Cause

underlying the whole universe. The logical process will be from nature to nature's God.

### A Catholic Synthesis of Science

There can be no doubt that a modern Catholic system of didactics can be made into the most complete, the most soul-satisfying that the world has ever known. As heirs of the ages, without selling our sacred birthright for a mess of pottage of physical well-being, we should profit by the mistakes of previous civilizations and incorporate whatever is good into a glorious complete synthesis. Education can be said to contemplate a fourfold understanding; viz., ourselves, the world in which we live, God, and finally the relationships existing among these three entities. The first understanding leads to creative self-expression in the arts; the second, to science as it exists in the physical and social world around us; the third, to religion, which includes the ultimates surpassing all human understanding; and finally to philosophy, which welds all knowledge into a systematic whole. Complete education must include all these elements, and the failure of previous civilizations can be traced to a lack of or to an overemphasis of one of them. Holding fast to philosophy and religion, we can profit without detriment by the marvels of present-day science and use them as means to higher ends.

Some laudable beginnings have been made in this supracultural synthesis by such men as Cardinal Mercier and Monsignor Fulton Sheen.<sup>6</sup> But much remains to be done. As Rev. Virgil Stallbaumer, O.S.B., expresses it: "Much knowledge must be assimilated and a great synthetic mind be set to work before philosophy can with right, claim [the privilege to pronounce with finality upon all topics], and can exercise such a role in reference to the modern epoch. Before it dare with anything like scholarly truth pretend to give a synthesis of modern learning, its generalization must be less rarely based upon moribund data. . . . Vast seas are still unplumbed. Such a status, however, should not cause dismay, because the Catholic mind is exquisitely equipped to garner in all fragments of truth; for, to cite the words of Dietrich von Hildebrand, 'the Catholic attitude will protect the researcher more than anything else against impatient, pedantic violations of the peculiar and autonomous nature of his special subject and her reverent listening will prevent him from rushing into hasty systematizations.'"<sup>7</sup>

May God see fit to send us soon this modern Aquinas with his new *Summa*, and thus usher in a greater and more resplendent Golden Era!

<sup>6</sup>Fulton Sheen, *Philosophy of Science*.

<sup>7</sup>Virgil R. Stallbaumer, O.S.B., "Objectives of the American Catholic Liberal Arts College," *Catholic Educational Review*, April, 1935, p. 199.

## Biology Hints

Sister Mary Charlotte, C.S.C., M.A.

Among the numerous activities of school life, none is more important than those of the science laboratory. Though some elementary science is blended with the study of geography and hygiene, the cultivation of the scientific attitude is left almost entirely to the high-school teacher. Even for those who have neither the opportunity nor the inclination to go to college, a great deal can be done to encourage interests and hobbies for life. Some of my pupils have reacted so favorably to investigations which we have made, that I have been led to think other teachers might like to hear of them, and these teachers in turn would feel prompted to share their ideas.

The least costly method is usually the one that I try to select for obvious reasons. At the beginning of the school year, I acquire two white rats whose presence alone helps the idea that we are studying living things. In about twenty-eight days there will perhaps be more rats, and when they are a month old we use them as subjects for diet experiments. After careful weighing and charting, rats on the different diets are put in separate cages. The diets this year were: (1) a well-balanced diet, (2) protein only, (3) raw vegetables only, (4) white bread and water.

The changes in weight are notable in a short time. After one week those on diets 1 and 2 had gained half their weight, those on 3 had lost half their weight, and those on 4 had gained nothing. In a month's time, those on bread and water become decidedly rickety. We found it better to weigh the rats every two days as they respond so quickly. In connection with this study, we found the free charts and booklets sent by the National Live Stock and Meat Board of Chicago interesting and helpful, being very clear and concise.

Bacteria is a subject that arouses interest. Potato cultures, which are prepared by simply cutting the potato the desired size, soaking for a short time in a weak solution of baking soda, are very good for the study of pigment. An agar culture is just as satisfactory for our purposes. The following is what we used. To a cup of water, add a tablespoon of agar flakes, a pinch of salt, a tablespoon of karo syrup, a tablespoon of tomato juice, boil, and filter. Place this culture in the petri dishes, and expose to such sources of bacteria as the following: a powder puff, coughing, kissing, dust of the hall at the change of classes, an old dollar bill. The biggest surprise was from the culture containing the bacteria from the dollar bill. The colonies and fungal growths

<sup>5</sup>Alexis Carrel, *Man the Unknown*, p. 27.

were luxuriant, much more so than from any other source. The value of several disinfectants was determined. One infected culture was painted with mercurochrome, another with iodine, and another with listerine. No colonies appeared on the dishes thus treated. Some teachers are perhaps thinking that I placed these petri dishes in a forty-dollar incubator, but such is not the case. Our incubator is an old starch box, in one end of which is fixed a 25-watt electric light surrounded with asbestos. The sliding cover found on such boxes makes a convenient door, and the heat supplied is sufficient for our purposes. This experiment is carried a little further by making slides from the colonies obtained. A suitable method is the following: On a clean slide place a drop of distilled water, in which place some of the culture. Dry with gentle heat. Place a few drops of aqueous gentian violet 5 per cent on smear, heat gently again. Pour off the stain, wash in 20 per cent copper sulphate, and blot dry. This method shows the capsule of the bacteria, most common forms show up clearly, and the technique is easy.

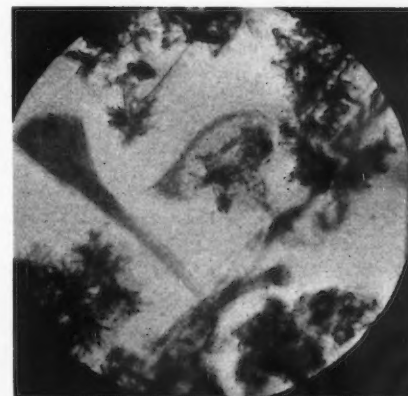
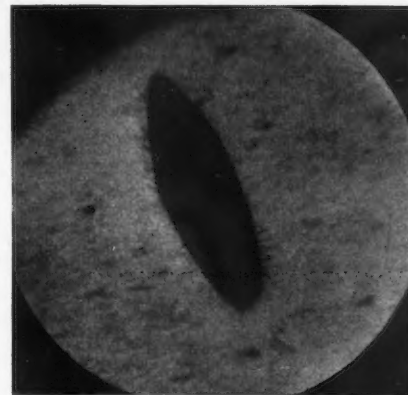
For those who feel that the high-school biology course should include a rather detailed study of the phenomena of heredity, I would like to call attention to an article in *School Science and Mathematics*, May, 1936, in which an easy and good experiment with the drosophila fly is outlined. Most of the material can be used to advantage by the secondary teacher. The crosses to be made

are suggested, and the cultures described. The extra burden of this work might help to answer the difficulty in handling the superior student. If, however, because of a lack of facilities or time, you do not wish to try that experiment, let me mention an easier way to impress the 3:1 ratio of Mendel. Use coins instead of flies. Take two coins, perhaps a dime and a penny, and represent a pair of chromosomes for the dime as HH, and for the penny as hh. The first hybrid generation will be Hh which can be represented by a nickel. Shake the coins, represent heads by HH, heads and tails by Hh, and tails by hh. Place those with HH and Hh in one column as H represents a dominant characteristic, and those of hh in another column. The more trials made, the nearer the 3:1 ratio you will obtain. We got in the first column 1428, and in the second 479. This reduced to 2.98:1 which is very close to the ratio 3:1.

	HH	hh
F <sub>1</sub>	Hh	Hh
F <sub>2</sub>	HH Hh Hh hh	

The study of fresh-water biology arouses the greatest enthusiasm. I have found it well to begin the use of the microscope in September for everything possible, so that the student may become proficient in focusing, using high and low powers, and also in moving the slide around. By the time the swift moving organisms which are found in a hay infusion dart through, they are able to follow, quickly and easily. Though the animals can be slowed up or fixed, I have found that a dead rotifer, or a prepared paramecium arouses almost no interest except as check on the appearance of the protozoa which they hope to find alive. The preparation of these organisms for permanent slides is a difficult and long procedure, but I have found in photography a splendid substitute record. Many supposedly easy methods of taking microphotographs seem too difficult for me. I have made a way for myself that is easy and successful, as the pictures show. When the focus is clear, and the object well centered in the microscope, use either daylight, electric light, or even the darkfield; place a Brownie camera of any size, set for time exposure on the eyepiece of the microscope. Care must be taken to use no pressure, otherwise the focus is disturbed. I find it a good practice to remove the camera, and take a second look at the object, then replace it carefully, and take a time exposure for six seconds. A collection of these pictures with date, origin, and name recorded would supply a hobby of very great interest to a biologist. One may not be able to prepare a stentor just as it divides, or a paramecium conjugating, but a picture which is taken at the crucial moment makes such a record possible. The films need not be too great an item of expense, for it is quite easy to learn to develop them, or even to use the cheaper blueprints.

In conclusion, I would like to mention some sources of helpful material, thinking that perhaps someone will be as happy to find them as I was. The free literature distributed by Turtox holds a prominent place; to mention a few: *Turtox News*, *Turtox Leaflets*, *Turtox Catalogue* and *Teachers' Manual*. The Ward Natural Science Establishment of Rochester, New York, sends practical helps; the best, I think, is *Directions for Collecting and Preserving Insects*. Besides supplying extra work for the bright student, this fills a demand for activities for a science club. A magazine that I discovered only re-



Upper: Paramecium Magnified 450 times  
— Cilia stained with Boudin's Solution.  
Lower: Stentors Expanding — Magnified 100 times.

cently is the *Teaching Biologist*, the official organ of the New York Biology Teachers (\$1 a year) which has such useful suggestions as Laboratory Mice, Culturing Protozoa, and many other hints which are just what we most want, including book reviews of all the new biology books. Those particularly interested in the microscopic work will find *Practical Microscopy*, a recent publication from New York, an invaluable aid. Finally, I would like to mention a book that every biology teacher would like to own, it is Anne H. Morgan's, *Field Book in Ponds and Streams*, published by Putnam in 1930.



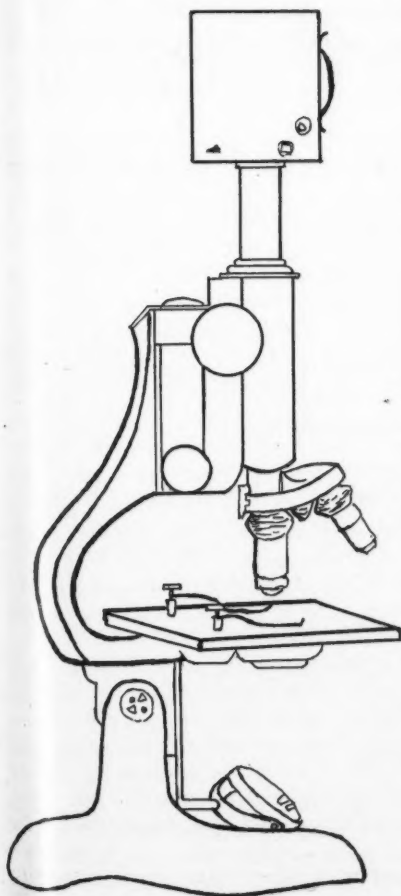
## Plaster Leaf Prints

Sister M. Charlotte, C.S.C., M.A.

The making of plaster leaf prints is a very attractive device in connection with nature study.

1. Place leaf face downward.
2. With a flatiron press modeling clay upon the leaf. Remove the leaf carefully.
3. Pour a rather thick mixture of plaster of paris on the imprint of the leaf.
4. Paint the plaster-of-paris mold of the leaf.

The leaf appears to be sealed on the plaque, and some children try to pick it off, thinking it to be a real leaf.



Position of Microscope and Camera

# The CATHOLIC SCHOOL JOURNAL

Edward A. Fitzpatrick, Ph.D., LL.D., Editor

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## Science in Education

We are glad in this number of the CATHOLIC SCHOOL JOURNAL to emphasize the teaching of science. Science is an essential part of the content of education at all educational levels. The knowledge is necessary for the direction of one's personal life. It is necessary, as Spencer long ago pointed out, for direct self-preservation, for indirect self-preservation, and for our social, civic, and leisure activities; but that is not the only thing needful, nor in some aspects the principal need.

The issue of science is raised today most significantly on the college level. President Hutchins has seemingly placed science in an incidental place in the curriculum. It deserves more consideration. It is an essential part of our civilization. We need to understand it, appreciate it, and use it.

But we seriously make a mistake when our science gets mixed up with our philosophy. The real problem in education so far as science is concerned is to keep science as science, and not let it be dominated by naturalism. Dr. Foerster has put the case well as far as a liberal education is concerned. He says:

"They taught not only natural science and the method of science, but, consciously or unconsciously, a naturalistic interpretation of life."<sup>1</sup>

But more significantly he returns to the subject later in the same work, as follows:

"Since the naturalistic tradition today claims the immense prestige of science, humanism, in opposing naturalism, is often mistakenly regarded as opposed to science. The presumption seems to be that when the one is attacked, the other is attacked also. But science is not the private property of naturalism: it is the product of the human spirit, and is prized as such by humanism. Clearly, humanism could not be hostile to science without being hostile to the Hellenism from which it ultimately derives. The attitude of humanism toward science has a sufficient spokesman in a Hellenist like John Burnet, who has said: 'Man is ignorant, but he knows that he is so, and he cannot rest in his ignorance'; 'Whatever else science may be, it is one

of the spiritual conquests of mankind'; 'Science depends upon Humanism . . . since it is only the Humanist point of view that can furnish an adequate motive for its pursuit or even a justification of its existence.' Consequently, if the day ever arrives when science is imperiled by obscurantism, humanists will be found fighting side by side with scientists against the forces of darkness. For humanism believes in light, in knowledge as a good in itself and in knowledge applied for the use and benefit of mankind. Without science we should assuredly be more ignorant than we are and less able to shape nature to our human ends."<sup>1</sup>

## Congratulations Archbishop Mitty!

It was good news that came with the opening of the current academic year that Archbishop Mitty of San Francisco had purchased St. Mary's College in the Moraga Valley near Oakland for \$715,000. It ended for the present the financial problem of St. Mary's. It put an end to very bad national publicity that had been given annually to the financial problem of St. Mary's for several years. It made the future of St. Mary's sure.

The Archbishop has wisely, we think, continued the Christian Brothers in charge of the college. They had developed it and had only recently removed to the new campus when bondholders became too prominent a factor in the college consciousness.

The Archbishop, in purchasing the college for what in any case must seem a large sum—although it represents only fifty cents on the dollar for the bondholders—did a courageous act and, we are sure, a wise one.

The financial burdens of a higher education are many and great. I fear that with the multiplication of colleges we shall probably learn more about the financial burdens—or bishops may.

We have watched with a good deal of interest one aspect of St. Mary's work. It is the tremendous influence of a single individual on the community and on the non-Catholic higher educational institutions in the region. Brother Leo is a tremendous factor in San Francisco and is worth, practically, to the Catholic cause an untold spiritual endowment. It is good to keep him where he is so effective and where, as Archbishop Mitty knows, the archdiocese of San Francisco will continue to profit greatly from his services. May the services of all who teach at St. Mary's serve the diocese as well in their various ways.

Congratulations Archbishop Mitty!

## Shall We "Grade" Children? How?

Dr. Henry Suzzallo put in a thoughtful and suggestive way the problem of grading when he said:

"The problems of the child's expanding life must be graded to his ability. This is the only sense in which grading at school means anything vital.

"The present method of school grading, as we know it, ought to be taken out of the daily consciousness of public, parents, children, and fellow pupils, and whatever is valuable in recorded grading and appraisal, particularly that which we have acquired through new scientific techniques, should be put into the professional and confidential records of the school as an aid to diagnosis, guidance, and the redirection of the process of education.

"The psychological grading of school tasks will at once bring

<sup>1</sup>The American State University, by Norman Foerster, Chapel Hill, North Carolina, 1937.

to mind the great signal fact of our new scientific knowledge of human beings; that is, their individual differences.

"When the profession recognizes that actual differences in children are often due to the accidents of early or present environment, to ill health, and to acquired interest or disinterest, then no deadly fatalism enters into the judgments of teachers. Whatever nature has done to limit a child, we cannot help; whatever environment has done, we may ameliorate. And it is better to assume too much where we can be of help, than too little. Practical justice lies on that side of error."

Attention is specially called to the second paragraph: the emphasis on grading as entirely an internal matter of school administration, and valuable only as it is suggestive to the future handling of the child. If we could only get this conception adopted generally in education, it would stimulate greatly the interest in the educational process itself instead of in extraneous matters. It would center our interest in the child in his capacity and his ability and his promise. It would help us more nearly to understand the present situation with reference to the child, how it came about and what the future may hold in store for him.

I wonder why we do not adopt such an insight. The schools may not be entirely to blame for the parent's desire for such a definite statement of the product of education, but the school has the responsibility to educate the parent to a more intelligent attitude with reference to the school process. Are we ready to make the break with the easygoing way that we have been following in favor of a more intelligent way because it is perhaps a little more difficult?

## Laboratory and Demonstration Methods in Science

There has been a strong tendency recently toward giving a larger place in science instruction, particularly in secondary schools, to demonstration. It had been assumed that unless students actually manipulated the scientific equipment and went through the ritual of the laboratory manual, there could be no education in science. We have come to realize that it is the idea the student gets that is the important thing, and this is often as effectively stimulated by the demonstration method as by the laboratory method.

All students should actually perform some laboratory experiments in order to appreciate the scientific method. But it is possible that a wider knowledge and appreciation of science could be given our students if for the student body generally laboratory experiments were used to teach appreciation of the scientific method, and demonstration courses were given in several sciences so as to broaden the base of scientific knowledge among students.

## The Teacher of Science

The teacher of science in the high school is not a research worker nor is he a trainer of secondary-school students in scientific investigation. He is not, either, a purveyor of mere facts. He must be an interpreter. He must teach appreciation and attitudes as well as facts. He must certainly give students besides scientific knowledge an appreciation of the scientific method. He must use it in his class.

In a recent very interesting book on *The High School Science Teacher and his Work*, Carleton E. Preston points out this aspect of the teacher of science as an interpreter — an inspiring interpreter. He says:

"However much or little the true secondary-school science teacher may be concerned with research activities, he is and must always be, a skillful and appreciative interpreter, keenly alive both to what is being done in the line of broad scientific advance and to its significance in world development. He must also be skilled to the habitual use of the methods of scientific observation and reasoning in such a way that he can both apply them to his own task and, through example as well as precept, inculcate them in his students. Beyond and above this, he must have a real interest and enjoyment in working with young people."

## The Constitution of The United States

The President of the United States has designated the period from September 17, 1937, to April 30, 1938, inclusive, for the commemoration of the one hundred and fiftieth anniversary of the signing of the ratification of the Constitution and of the inauguration of the first president under that Constitution.

The President goes on in his proclamation to say: "It is therefore appropriate that in the period herein set apart we shall think afresh of the foundation of our government under the Constitution, how it has served us in the past and how in the days to come its principles will guide the nation ever forward."

It is certainly a very opportune and appropriate period of celebration. The recalling of the fundamental facts regarding the establishment of the United States as a government among the nations of the world and, more particularly, the principles and the form which that government took and has sustained until today are problems that should be constantly brought before the minds of the American people. We cannot too often, as the constitution of the State of Wisconsin says, "recur to fundamental principles." The problems of human liberty under law, the public-service function of government, the public-welfare justification for government, the sanctity of the individual, the fundamental rights of freedom of worship, of free speech and free assembly, all are matters which the American democratic society should keep constantly before it.

It is consequently of the utmost importance that the schools shall build into the character of the people the fundamental nature of the American government, with its great principles of human freedom and service to humanity. Whatever the requirements of the course of study, it is essential that in the next year and a half every school and particularly every Catholic school shall emphasize anew and continually recur to the great principles of the American government. Under such principles the Catholic Church can grow and develop to its full stature. Under other principles it has suffered and is suffering.

## Applied Philosophy

"The teaching of philosophy must be vital. Its principles should not appear as the result only of great thinkers of the past, but as eminently pertinent to life in all its phases and to every human institution no matter how recent its origin," said Rev. George A. Deglman, S.J., professor of philosophy at Creighton University, in addressing the Mississippi Valley Jesuit Philosophical Association. The mistake of applying a single, inflexible pattern of teaching in colleges, he said, is the direct cause of the discouraging results in educational programs today.

# Correlating Science and Other Elementary-School Areas

Glenn O. Blough, M.A.

**T**HE reader of this article is cautioned to keep in mind the fact that the points of view and suggestions given are based on two sources: First, the experience of the author in working with elementary teachers who are interested in relating science to other school subjects and second, the writer's contact with the actual teaching of grade-school science. The discussion does not involve research findings and is presented merely to set forth one method of correlating science with some of the other units of subject matter in the elementary-school curriculum.

There have been many changes in points of view regarding the correlating of elementary-school subjects since the idea that each subject does not stand by itself first began to take root in the minds of teachers and supervisors. These opinions and practices have varied from that of teaching virtually every elementary subject by itself, to that of integrating the school courses to such an extent that elementary-school subjects no longer exist as such. There have been movements to make various elementary-school subjects the core of the curriculum. The subjects chosen to represent the nucleus were those that in the minds of the various supervisors and administrators lent themselves best to involving varying activities that could engulf tool subjects as well as the content in the elementary field. Playing an important part in all of this evolution has been the appearance of the activities program. Such a program is bound to break down barriers between the hours spent for reading and those spent in spelling and arithmetic.

This article is not a plea for science as the core of any curriculum. It is not to be interpreted as saying that a study of science in the elementary grades is a panacea for all elementary curriculum ills. It is, however, suggested that because frequently in the crowded grade-school day there is a very limited amount of time allotted for science as such and because science is an interesting and valuable subject to elementary pupils, and because the intelligent study of science involves many of the other grade-school subjects, it may be considered thoughtfully as one of the sources of knitting together an elemen-

tary-school day and of helping pupils to see a need for learning.

## Activity Projects

Before proceeding farther, let us look more closely at each of these points. In an already crowded day in the elementary school, the universal inclusion of science is destined to be a slow process. One period a week in many schools is the maximum. In countless numbers of others the subject is assigned to an incidental part of the week's activities. In only the more opulent and progressive schools is there as much as a period a day allowed for the teaching of science as a separate subject. This being true, if time from other subjects, such as reading, oral and written expression, and art, can be taken for science study through activity in these subjects, the progress of introducing science in the grade-school program will be greatly facilitated.

The enthusiasm demonstrated by elementary pupils in the study of their surroundings is gratifying to those interested in child growth and development. When intelligently taught, the outcomes gained from the study of science are vastly important. Space will not permit a discussion of them here.

## Solving Interesting Problems

If the procedure in science teaching is one of raising problems with the pupils, solving the problems through various methods; i.e., reading, experimenting, interviewing, observing, etc., and recording findings in such a way that pupils can thoroughly organize these findings and see meanings and relationships, then other school subjects must necessarily be involved in the study of grade-school science. These subjects naturally almost correlate themselves with science in bringing about a more complete understanding of the science subject matter. Perhaps, then, if we are working in a school system where programs are flexible enough, we will dispense with the idea that we are studying reading, arithmetic, language, and art, and substitute the point of view that our classes are engaged in solving problems of interest and in pursuing any activities that will contribute to a satisfactory solving of such problems. The name of the subject

studied will be of no moment; the point in question will rather be: How is this complete activity contributing to the growth and development of the boys and girls?

## Specific Correlations

Needless to say, there are certain elementary subjects that contribute more and are more innately involved in the study of science than are others. Naturally, skill in reading is of fundamental importance when pupils need to refer to authority to find satisfactory explanation to their science problems. Oral expression, in its various forms, is necessary when pupils are interpreting their findings to the group or when they are discussing plans of procedure. Written expression necessarily contributes in many ways toward science study. Taking notes during reading, outlining and organizing findings, recording the results of an experiment, making detailed summary statements to assemble findings, all involve the skills of written expression.

Should pupils wish to picture their findings by drawings, sketches of experimental apparatus, charts, graphs, etc., the principles learned in art should, of course, be employed. This does not, however, mean that the art always involves science or any other subject. It means that here the study of science is facilitated by the use of art and art materials. If there is to be real learning in art, then this learning must be carried over to other fields of endeavor where it is usable.

If the study of science involves number concepts and arithmetic skills, then the arithmetic lesson may well be of a science nature. For example, in the study of air pressure in grade five, the pupils have learned that air presses approximately fifteen pounds per square inch on all surfaces at sea level. The experiment used to teach this fact involved a rectangular varnish can. During the experiment the air pressure completely crushed the can. Some child asked, "How much air pressure is there on the outside of the can?" One child estimated that the pressure on the can was greater than the combined weights of all the pupils in the fifth grade.

The arithmetic lesson planned for the day was abandoned. Eagerly the pupils

went through processes of addition and multiplication. When they arrived at the point of deciding on the next step in the procedure, there were many enthusiastic suggestions, and when a new type of problem solving became necessary, the response was "Let's learn how." Incidentally, the pupils found it necessary to add the weight of the teacher to the class weight in order to equal the pressure exerted by the air!

This incident illustrates a real need for arithmetic. Such a need may, of course, not arise every day. When it does, however, it requires an intelligent piece of teaching to make wise use of the incident. When it does not arise, it requires intelligent teaching not to try to force the arithmetic where it is not needed. This principle, of course, holds true wherever relationship of school subjects is concerned.

Frequently the study of science involves experimenting of various kinds. Often the material necessary is not available, but the facilities for its construction may be available in the form of materials in the shop, if there is such a department in the school. A bird-feeding station, a convection box, a test-tube holder, covering for the laboratory table, repairs for an electric motor, and work on countless other science materials may well be included as part of the activities carried out in a general shop where pupils are learning to work with tools.

### Practical Illustrations

Let us illustrate from practical instances how such plans for correlating elementary-school subjects can be executed. Because the reader may be quite definitely interested in a specific grade, rather than in the whole school program, let us divide our exemplary material into two groups: First, that emphasizing primary grades; second, that involving the later elementary school.

The children are studying a unit of material built around the problem: "How are living things protected?" The unit is opened by a discussion period in which the pupils express their opinions on such questions as "How do you think animals can protect themselves?" "Do plants protect themselves in the same ways?" This discussion may cause many questions to arise in the minds of the pupils.

Perhaps the next step will be the listing of such questions, being careful to state them so that they ask the exact things that the pupil wants to know. The questions probably will be listed first on the board, then if the teacher thinks it necessary, each child may make

a copy for his own reference.

Methods for answering the questions are suggested by the pupils and teacher. "Let's look in books." Use of index and table of contents is necessary. Then reading skills are involved. Again there is discussion to clarify points and to add to the knowledge by relating experiences.

Thus the study proceeds. Perhaps a visit to a zoo may be planned to observe various animals to see how they are adapted to defend themselves, or a visit to a greenhouse or woods to observe plants and animals may be found advisable. Such a visit may involve letter writing or writing notes of thanks. It may seem advisable to make a record of the findings of the visit after the return. Perhaps the art teacher may help the pupils to make sketches while they are in the field. These may be used later to illustrate an account of the visit when the pupils show their parents or other guests the result of their science study.

Pupils may think it interesting to bring an animal and its young to school and observe their activities from day to day. Here the discoveries may be assembled in the form of a diary that summarizes the learnings in science.

The extent to which correlation in such a unit is carried depends, of course, on the nature of the unit, the interest of the pupils, the freedom with which the teacher is permitted to manipulate the order of her day's program, and the time allotment for each subject. In any case, the question asked should be, How much opportunity does all the activity present for the child's growth and to his enjoyment of school and of life?

An example of a unit in the later elementary grades: Pupils are studying magnetism and electricity. The initial period of experimentation brings up the usual problems that are not easily solved. The pupils gather reference books and other materials that will be of help to them. They may organize in outline form the problems that are to be solved and their ideas of procedure for solving them. They read, experiment, and observe. Other grades in the same building become interested in the experiments going on in this sixth-grade room. The pupils decide to organize their knowledge and present it to the pupils in one of the other rooms. They plan the procedure, remembering that they are trying to explain very clearly and to illustrate well enough so that their audience can understand exactly what the speakers are saying.

Each pupil chooses the experiment he wishes to show. He collects the neces-

sary material. He plans the method of experimenting. He decides to make an outline so that his explanation will be clear and logical. He submits his outline for group criticism. He presents his talk and demonstration before his group for helpful suggestions.

Committees are appointed to take care of the room planning. Another grade is invited. Discussion follows regarding how the plan can be improved before the experiments are shown. Pupils may decide to send the equipment back to the room with the visiting grade so that those pupils may perform some of the experiments at their leisure. If this is done, it may appear wise to list the apparatus and send with it a set of directions for doing each experiment, as well as for taking care of magnets and the other equipment.

Perhaps through all of these activities in both grades there has been no special compartment or hour for the study of language, reading, spelling, etc., but there has been willing, zealous work on the part of the pupils. There has been learning going on in a more purposeful situation than otherwise might have been the case. Generally speaking, there has been no forced relationship between school subjects. The teacher has found time for some science work in which the pupils are intensely interested. The other school subjects have been employed because they are necessary to a more thorough study of the science problems at hand.



### SCIENCE IN THE CATHOLIC SCHOOL JOURNAL

*A Science Program in Primary Grades* by Sister Mary Ancilla appeared on page 250 of the September, 1937, issue. This helpful article might have been held for the special science issue, but the editors wanted it to be available at the beginning of the school year.

*Trees* by Sister F. Jerome, C.D.P., which is continued in this issue, began in the October, 1937, issue. The subject of trees is a good one for fall nature study.

*Homes of Birds and Animals* by a School Sister of Notre Dame, is scheduled for February, 1938. This is a fine article on a subject especially good for springtime. It correlates nature study, religion, citizenship, arithmetic, English, etc.

As an excellent illustrated article on the scientific phase of geography, you will recall *Meridians, Location, and Time*, by Sister M. Consilia, in the July, 1936, issue, pages 195-198. For another of this class, see *A Project on Wheat*, by Sister Silverius, C.D.P., November, 1936, page 308. Also see *Apparatus for Preserved Specimens* by Sister M. Gerarda, O.S.F., March, 1937, page 83.

Our invitation to submit articles on teaching science is bringing in more articles too late for the November issue. Some of these will appear in following months.

# Primary Grades Section

## A Living Puppet Party

Sister Mary Mildred, O.S.M.

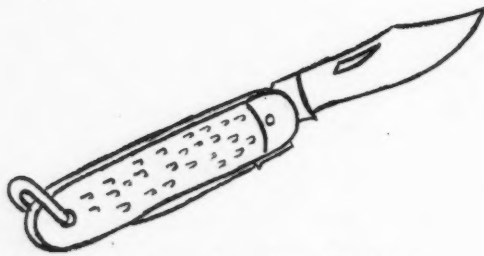
### Good-News Board

We enjoyed the Fourth-Grade Puppets.  
What holiday comes in November?  
What is a "Living Puppet Show"?  
Can we give one for Thanksgiving?

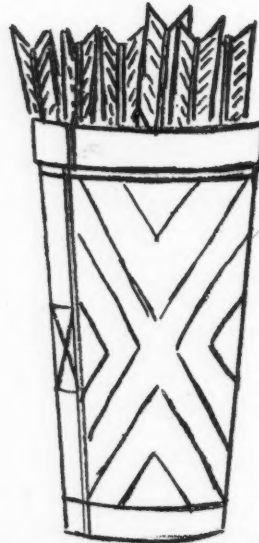
Upon the "Good-News Board," the first day in November, the above notice appeared: We decided we could and we did. Colonial Thanksgiving Day was chosen as our theme.

Instead of puppets manipulated by strings we decided that each child would himself form the puppet. He would pass behind a screen, show what he represented, and do the speaking—himself unseen. In this way excellent practice was secured in oral speech as well as in art work and social history. Our parents were to be the guests.

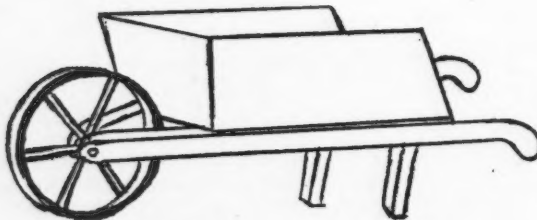
For our stage we used the wide doors opening into the entrance foyer of room one. About two feet in front of the doors we



I am a Jack-Knife.  
Two of Us  
Saved a life.



Quiver of  
Arrows



Wheelbarrow



Duster of  
Turkey Feathers

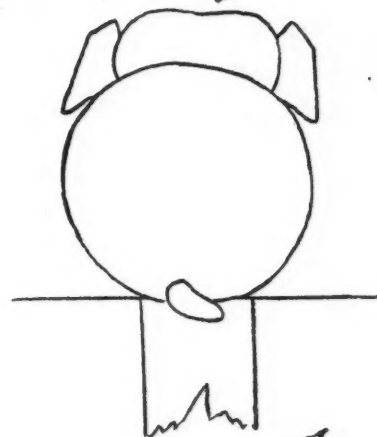
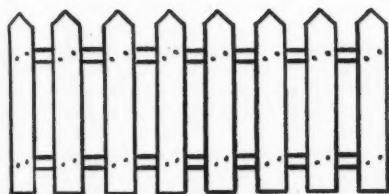
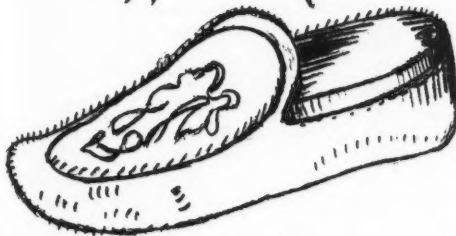
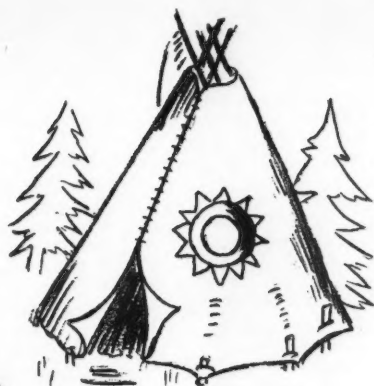


Anvil

Tools Familiar to Brewster Boys



Pilgrim Children

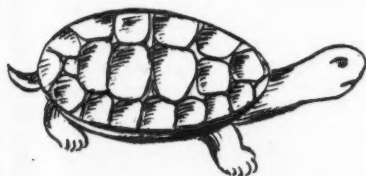


*Things Seen Every Day by Pilgrim Children*

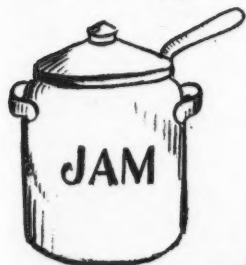
erected a screen made by the children themselves by pasting tan Kraft paper upon a cardboard "tall" enough to allow the children to walk unseen behind it. It had side standards for support. Upon its center *we* pasted the word *welcome* cut by the children from orange construction paper. The upper and

side portions of the doors were draped with a light-brown crepe paper. A background of sky, hills, and trees was sketched upon Kraft paper and hung from the outer side of the double doors. Performers stepped between the background curtain and the front screen.

Out of the preliminary story telling, picture



Of Turtle do  
Make soup  
and stew.

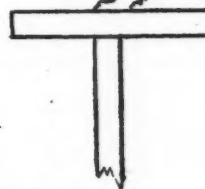


Jam sweet  
For me  
to eat.



Lobster red  
Eat with  
Bread.

*Some Foods Eaten by Pilgrim Children*



*Symbols to Identify the Children*

hunting, etc., the following organization of material was decided upon:

- I. Pilgrim Children of Plymouth
  - A. How They Came to America
  - B. Why They Came
  - C. Names of Children on *Mayflower*
- II. Some Foods Used by Pilgrim Children
- III. Tools Familiar to Brewster Boys
- IV. Things Pilgrims Saw Every Day

The names used for children on the *Mayflower* were:

*Girls:* Remember Allerton, Constance Hopkins, Damaris Hopkins, Oceanus Hopkins (born on the Ocean), Humility Cooper (with green parrot), Mary Coulton (supposedly the first girl to step on Plymouth Rock).

*Boys:* Resolved White, Love Brewster, Wrestling Brewster (the latter two with wolf-hound puppies), Jasper Moore, Samuel Fuller, Henry Sampson (with spaniel dog for a pet), Francis Billington (who fired off father's musket in *Mayflower* cabin), other Billington boy (captured by the Indians and traded back to the Governor for two jackknives).

Three types of figures were taught the class for the representation of Pilgrim children: (1) drawing mounted upon cardboard; (2) dressed clothespins; (3) clay figures (see

illustrations). The finished models were mounted upon a tongue depressor or other flat stick. If the child possessed a pet or other identifying symbol, the latter was represented also.

Clothespins were imbedded in a small cylinder of clay, which was then allowed to harden. Costumes were made from circular pieces of black construction paper. Smaller circles of white were used for collars. Features were painted upon slightly flattened heads with wax crayons. By slightly varying features and costumes different names could be applied to the Pilgrim children. Clay figures were made and costumes painted on with Alabastine paint.

Invitations were sent out, printed upon an arrowhead. Lunch consisted of candied apples, popcorn, and "pink" lemonade.

Each mother was proud of the contribution of her child, since it was his own, both as to choice of subject and manner of developing it—even to his speech. Corrections were made only indirectly.

Various fall art work was displayed around the room. Each child had a sheet of Manila tagboard 2 by 3 ft. Upon this his work for the month was mounted. It was a very worthwhile project, both as to enjoyment and profit.

But she could always think quickly about how to get out of it again.

[Now that the soup had cooled sufficiently, Mrs. Black lifted her bouillon cup and sipped it as she would tea. Mary did the same.] [48]

MRS. BLACK: She must have been a smart little girl. Even grown-ups cannot always find a way out of their troubles.

MARY: Maybe their troubles are bigger. Mrs. Schmitt says there is no end to her troubles. [49]

MRS. BLACK: Who is Mrs. Schmitt? Do I know her?

MARY: I think not. She is the woman who does the cleaning in my father's office.

[The maid came to their right-hand side and taking the service plate with the bouillon cup on it, placed a dinner plate before each.] [50]

[The maid held a platter of chicken and different kinds of vegetables close to Mary's left-hand side. There was a wide fork and a serving spoon on the platter and Mary helped herself.] [51]

MRS. BLACK: Oh my! That is trouble.

MARY [Using her dinner fork to take a bite of salad that is to her left but pausing to speak] [52]: It isn't the scrubbing that is her trouble. It is the taxes.

MRS. BLACK: Taxes! She owns her own home then. That's more than I do.

[The maid passed the rolls and Mary placed one on the bread-and-butter plate where the little butter spreader lay. Mary had been careful all through the meal that no used knife, fork, or spoon lay on the tablecloth, or partly on the tablecloth and partly on the plate. She was careful, too, that she got no spots on the tablecloth.] [53, 54, 55]

MARY [looks around the room]: But she has no pretty things. She put all her money into that house and now work is scarce and she can't pay the taxes.

[Both Mary and Mrs. Black have finished and placed the knife and fork side by side across the plate, the handles slightly toward the right. The maid then clears the table of everything except the water glasses. She removes any crumbs that may be on the table and refills the water glasses. The maid then brings in the dessert plates which she places before them. On each is a fork, a little lace doilie, and a finger bowl. They remove the finger bowl with its doilie and place it to their left. When the maid then passes the cake they help themselves with the cake knife which is on the cake plate and eat the cake with the fork.] [56, 57, 58]

MARY: It takes all the money Mrs. Schmitt can earn to buy food. You see she has six children.

MRS. BLACK: Six children! My, my, that means a great many shoes, too.

[The maid put a glass of milk at Mary's right; a cup of coffee at Mrs. Black's right; then offered her from the left side, the cream and sugar on a little tray.] [59]

MRS. BLACK: Let me give you another piece of cake, Mary.

MARY: Not any more, thank you, Mrs. Black. But it was very good.

MRS. BLACK: Nothing more? Then shall we go out on the balcony? [60]

[Without folding it, Mary places her napkin on the table at the left of her plate.] [61]

MRS. BLACK: Six children, well, well! When you see Mrs. Schmitt again give her my address and tell her to come to see me. I think she needs a helping hand. Will you say grace, please?

MARY [they stand]: We give Thee thanks,

## Practical Lessons in Graceful Manners

Mary Caldwell Keyser

### III. AT LUNCHEON

CHARACTERS: Mrs. Black, Mary Grace, and the Maid.

SCENE: The dining room in Mrs. Black's house. The table is set for two. The maid has just finished filling the water glasses and looks at the table to see that all is in readiness before she steps to the door of the living room and, speaking in a low voice, says:

MAID: Luncheon is served. [40]

[Enter Mrs. Black and Mary. Mrs. Black indicates with a slight movement of the hand where Mary is to sit. They go to their places and remain standing.] [41, 42]

MRS. BLACK: Will you say grace, Mary, please?

MARY: Bless us, O Lord, and these Thy gifts, which of Thy bounty we are about to receive; through Christ our Lord. Amen.

MRS. BLACK: Amen.

[Mrs. Black and Mary take their napkins which are at the left of their plates and partly unfolding them, lay them across their laps.] [43]

MRS. BLACK: You were telling me about your going to the movie last Saturday afternoon, Mary. What show did you see? [44]

MARY: I saw "Little Lulu Lou," Mrs. Black.

MRS. BLACK: Did you enjoy it?

[Coming to their right-hand side, the maid placed a cup of bouillon with its saucer on the service plate. Mrs. Black took up her bouillon spoon which was the piece of silver farthest to the right and Mary did the same.] [45]

MARY: Yes, but I was sorry for all her trouble.

MRS. BLACK [Dipping the spoon away from her as she takes her soup]: So "Little Lulu Lou" had trouble!

[The maid came to Mary's left side with a plate of salted wafers. She held a napkin on the hand where the plate rested. Mary put

EDITOR'S NOTE. These dramatizations for the teaching of manners are graded. This third one on our schedule is intended for the third grade; the next will be for the fourth grade. The presentation of one of these at a meeting of your Home and School Association would please the mothers and help to motivate the undertaking for the children.

her bouillon spoon down on her saucer while she took a wafer and placed it on the bread-and-butter plate. She broke the wafer before putting it toward her mouth, but before she took a bite she answered Mrs. Black.] [46, 47]

MARY: She was always getting into trouble.



Almighty God, for all Thy benefits; Who livest and reignest, world without end. Amen.

MRS. BLACK: Amen.

*Exeunt.*

### SUGGESTIONS

[40] The correct way to announce a meal is, "Luncheon is served," or "Dinner is served."

[41] A hostess leads the way to her own dining room.

[42] Guests seat themselves when the hostess is seated.

[43] The napkin is at the left. Napkins are not fully unfolded and are placed on one's lap.

[44] The most important part of a dinner is the conversation; it should be interesting, pleasant, and sincere.

[45] It is always safe and always proper to watch the hostess and do as she does. Every household has not the same articles of silverware. Silver is placed in the order of its use.

[46] Do not put crackers in the soup; eat the cracker from the fingers.

[47] Never try to talk while there is something in the mouth. It is a very disagreeable sight.

[48] The spoon is dipped away from the one in taking soup. When soup is served in bouillon cups, it is permissible, when it has become sufficiently cool, to drink the last half of it from the cup as one would drink tea. At no time is a spoon to be left standing in a cup; it should be placed on the saucer. A cup or dish is never to be tilted to get out the last bit with a spoon.

[49] When invited to a luncheon or dinner it is necessary to keep up a conversation. Any simple thing that comes into one's mind, if it is kindly, is worth saying. People do not invite one simply to give the guest something to eat, it is the company that is desired. To be good company to one another is to be aware of what is in the mind of the other. It is poor judgment, therefore, to talk too

long or too much not giving the other a chance. The game of conversation is like the game of tennis—serve and return.

[50] Except before the dessert course when the table is cleared of everything except the water glasses, there is always a plate before each person at the table.

[51] There should be two articles of silverware on a platter that is passed making it easier to help oneself.

[52] Salad is at the left. It is cut, if it needs to be cut, with the edge of the salad fork if there is a special salad fork at the place, if not, use the regular dinner fork.

[53] Place on the bread-and-butter plate all the little extra things such as nuts, marmalade, and celery. The roll and the little pat of butter are there, of course.

[54] A knife or fork which has been used should not be placed on the tablecloth; not even partly on the tablecloth and partly on the plate. It should be placed across the plate toward the back when not in use.

[55] Avoid getting spots on the tablecloth. Accidents may happen to any one, grown-ups as well as children, so do not be unhappy should it occur, spots wash out and the hostess is always gracious. Perhaps that is why people love her.

[56] When one has finished eating all she cares to eat, the knife and fork are placed on the dinner plate, the handles slightly toward the right.

[57] When a finger bowl is brought in on the dessert plate, remove the fingerbowl with its doilie and place it to the left side of the dessert plate.

[58] Cake is eaten with a fork.

[59] Little girls who are carefully brought up do not drink coffee.

[60] The hostess, being sure that her guest has finished, is the one to make a move to leave the table.

[61] If one is not staying for another meal she need not fold her napkin. She places it at the left of her place as she rises.



## Christ Still Lives in Russia

Sister M. Genevieve, O.S.B.

**CHARACTERS:** Christ Child; Blessed Virgin Mary; St. Joseph; Three Kings; Herald; One leader angel; Angels, 10; Shepherds; Shepherd girl; Pages, 3; Carolers, 12; Mother and Father Rusek; Their children—Anka, Ivan, Jan; Mr. and Mrs. Jesch; Their children—Marchine, Lizbeth, and Carl; Mr. and Mrs. Broschvik; Their children—Agnesca, Wenclot, Didla, Petro, Antonik; Mr. and Mrs. Carlovitch; Their children—Matka, and Lena.

**COSTUMES:** Poor Russian peasant type—men with Turban caps, mackinaw coats, with belts, knickers, and high boots. Rubber boots are also good; bright woolen socks showing over the tops of boots. As each neighbor brings in his children, they come in wrapped with many scarfs and in blankets which are afterward used for their bedding. Anka and her mother have plain long dresses with wide, colored aprons which they tie at the waist.

The children dress in peasant type of dress. Carolers have bright red scarfs around their necks and a bit of holly or fir pinned to their caps.

Christ Child dressed as Christ at twelve

years, a heavy cloak or mantel covers him entirely except his face.

**STAGE:** Acts I, II, III. Scene in a poor peasant's hut. A plain small table at back center; folded blankets in left corner; a chair in right corner and another in left center to wall; and a small stove is at left down stage; door at right down stage. Windows as convenient.

Act III Scene II Tableau Scene. Stage plain to accommodate the characters for tableau.

**PROPERTIES:** Crib with an Infant. Virgin, and St. Joseph; Boughs of fir; A toy for Carl's pocket; 3 Pillows with gold, frankincense, and myrrh on each for the pages of the kings; Wood for Jan; Bowl of porridge—bread and milk or a thick soup.

### Act I

[As the curtain goes up Maria Rusek, the mother, is seen preparing the porridge. Anka is near her watching the proceedings. Jan comes in with an armful of wood and drops it near the stove.]

**MOTHER:** That's right, Jan, we'll need plenty of wood to keep the fires burning tonight.

**JAN:** It's so cold! I've almost frozen my

fingers chopping that last load. If father and Ivan would only hurry and come home, they'd help me out a lot.

**ANKA:** But father said he didn't expect to be home early and it's only six o'clock now, so you'd better not plan on having them help you so much.

**MOTHER:** And how glad we shall be when he comes. Such good news he will bring to us.

**JAN:** Oh, I wish he'd hurry! [stamping outside] Oh, goody, here they come. I knew they'd come, cause I just said a little prayer to the Christ Child and right away I hear them coming.

**MOTHER:** Open the door Jan, and let them in. [Jan does so and father stamps in and Ivan rushes to the stove to warm up.]

**FATHER [breathless]:** Joy, joy to this house! Maria, rejoice with me, but I must speak low, who knows but what one of those spying police might be around some place, but tonight there will be a Mass, God be praised! A Holy Mass at Comrade Vedery, in his barn and the older folks can go. How good God is! He still remembers His poor ones on earth.

JAN: Oh goody, goody then I will know and see what is done at a Holy Mass! Oh, how happy I am.

FATHER: No, Jan, you cannot go because the barn's too small and besides we are pretending that we are holding a meeting to help cure a cow that was very sick yesterday; but the priest will say the Holy Mass and give us the Holy Communion that we have waited for so long. God be praised! *[They all bow their heads, and for a second pray silently. Father unbuttons his coat and Ivan takes off his wraps.]*

ANKA *[breaks the silence]*: Am I big enough to go, mother? Oh, I want to go so much to Holy Mass, please, please let me go! *[Starts to cry or weep.]*

MOTHER: No, Anka, you cannot go and you know that it makes us feel very sad that we cannot have you see the dear Lord at Holy Mass, but you know the danger is great and too many people there would make them suspect us.

FATHER: Yes, and then Anka, you've a nice job for tonight. *[Anka gradually stops weeping and becomes interested.]* Neighbors Broschvik, Carlovitch, and Jesch are bringing their children here tonight and you must take good care of them. Well, I must now go out and take care of the horse and cow. We have much to do before ten o'clock tonight. *[Exit with Jan.]*

IVAN *[pulling off his boots]*: Mother, you know, the men that were at the meeting said that they had made a candle holder with a top to it so it wouldn't burn the hay. It's the nicest thing.

MOTHER: Precautions must be taken especially if Mass is to be said in a place of that kind. But God be praised that we will once again hear Holy Mass.

*[Jan puts his head in at the door.]*

JAN: Ivan, please help me carry in some wood.

IVAN: Just as I am taking off my boots, he asks me that. *[Begins lacing them.]*

*Curtain*

*[Curtain goes up as Anka is helping her mother to collect her clothes for going out. A knock is heard.]*

MOTHER: Go, Anka, and open the door. It must be one of the neighbors who is coming.

*[Anka opens the door. Neighbor Jesch with Carl, Marchine, and Lizbeth enter.]*

JESCH: Good evening, Comrade Maria! What a wonderful night for us! What a privilege we have! Now, Carl, be sure to be a good boy, and don't be too much of a bother and say your prayers before you go to sleep. *[to Maria]* Has Comrade Rusek gone yet?

MOTHER: No.

JESCH: Well, I will go look for him and we will start out. *[Exit.]*

JAN: Oh, Carl, what have you got there in your pocket?

MOTHER: Now, Jan, don't be too curious. Help him to take off his wraps and give him a place to sit. *[Jan does so.]* Anka, go out and see if you can find Ivan. I must still give him some orders. *[Anka puts on a wrap and exits.]*

MARCHINE: Will Anka show Lizbeth how to make a doll? I want one and Lizbeth wants one too. Don't you, Lizbeth?

LIZBETH: Oh, I do, and I want Anka to tell me some more of those nice stories about Jesus and Mary. You know she was telling me one once and a man came near us and said, "What are you talking about?" We ran away and Anka has never finished telling me about it.

MOTHER: Oh, Anka will finish it tonight, I'm sure. Did Anka come in yet?

CARL: I'll go and call her. *[He goes out and calls "Anka" off stage.]*

ANKA: *[off stage]*: I'm coming and Ivan with me. *[They enter.]*

MOTHER: Ivan, before I go I must tell you that you must watch the house carefully and if anyone comes around you must hide the secret.

JAN: Oh, mother, a secret!

MOTHER: Yes, a secret, Ivan and Anka know all about it and if you're real good children you'll find it out too. *[Knock is heard.]* That sounds like Mr. Broschvik's knock. Come in! *[Mr. and Mrs. Broschvik come in with Wenclot, Didla, Petro, Antonik, and Agnesca.]* Oh, what a fine family you're bringing us. Welcome Comrade Anna Broschvik!

MRS. B.: And Carlovitch is coming right behind us with their two little ones. *[Stamping is heard.]* Here they are now! *[Enter Carlovitch with his wife, Matka, and Lena who immediately go up to Anka and ask her to take off their wraps, and she does so.]*

AGNESCA: Oh, it's so nice and warm here, but oh, I wish I could go with you, father.

CARLOVITCH: No, you can't, my dear child, but be a good girl. We must hurry and go. Are you coming with us, Comrade Maria?

MOTHER: Yes, I am. *[to the children]* Be good now and we will tell you all about the wonderful Holy Mass, and take good care of the secret, Anka. *[They all exit. Mother to Anka]* Be sure, Anka, that the fire doesn't go out.

CARLOVITCH: Take good care of my little babootkas, Anka. *[All exit.]*

ANKA: Now, we're all alone. Ivan is going to get the secret and while he's gone *[Ivan leaves]* I'll tell you some stories and we'll get ready for the secret. *[Each one exclaims the following and all together.]*

LENA: What is the secret!

MATKA: What is it about, Anka?

CARL: Where is it?

LIZBETH: What is it like?

WENCLOT: Tell us what it is, now!

LIZBETH: Show me how to make a doll, here is my scarf and here is Marchine's, too, she wants one.

LENA: We don't want a doll. Tell us a story, Anka.

ANKA: Well, all sit down around here and I'll make Lizbeth a doll and tell you a story, too, one about tonight. *[Makes a doll out of scarf.]* You know about Jesus, our God. Well, the night that He was born it was cold like this and the stars were hardly out it was so cold, but one great big star was shining—

CARL *[interrupting]*: One like over our barn?

ANKA: No, it was very much bigger and it showed the place where Jesus was born in a stable, just like the barn where our fathers and mothers are going to see Jesus again at Holy Mass.

MATKA: Will they see Him like a little Baby?

ANKA: No, but they will see a round, white piece of Something that looks like Bread but it is really, Jesus. See, He doesn't get cold when He's like that.

LENA: Oh, I'm so glad.

ANKA: There in the stable were the dear mother of Jesus, Maria, and Josef. Maria was a beautiful, beautiful, Mother and she was taking such good care of Jesus,—and Josef,—*[Sound outside.]*

JAN: Oh, it's Ivan. He's got the secret!

*[Ivan comes in holding the crib and its contents all wrapped up.]*

ANKA: Oh, you came so soon, Ivan. *[The children rush toward Ivan.]*

CARL: Let's see it!

DIDLA and AGNESCA: Oh, what is it?

MATKA: Open it quick! Oh, hurry!

PETRO: It's so big!

ANKA: Just a minute! Let Ivan come way in. Now, we'll unwrap it and you can see it. Where did you find it, Ivan? Mother said you knew where it was but she didn't tell me.

IVAN: You know the old dried-up well near the wood? Well, father found some bricks that were loose and so he loosened a few more and dug a little cave inside the ground and hid it there; and the police didn't find it at all when they came around looking for all our holy pictures and statues. We saved that at least. *[They have it all unwrapped now; set it on the table in the center and the children exclaim.]* Oh! Oh!

CARL: Oh, what a sweet Baby!

ANTONIK: What a beautiful lady!

PETRO: Is that St. Josef there?

ANKA: Yes, that is St. Josef.

DIDLA: Oh! it's the prettiest, prettiest thing! *[claps her hands]*

ANKA: Now, we'll strip some of the branches from the tree near the house. Jan will you get a few branches. *[Jan goes out]* And everyone will put a little branch on the crib and say a little prayer.

WENCLOT: I'm so happy here *[points to his heart]* that I want to jump. *[makes a jump]* Let's play while we put the things around the crib.

*[Jan comes in—gives each a sprig of fir. They decorate the crib directed by Anka. A little drill-like game can take place here—form a circle, the smallest one being last—starts going in and out of circle till he comes to Anka near the crib. She directs each as to where to place the sprig on the crib. They may sing, "O Come, Little Children," from St. Gregory Hymnal or have soft music play here.]*

ANKA: Now, let's say a prayer to the Infant Jesus and then we will play a little bit before we go to bed. *[They bow heads in silent prayer, fold hands.]*

ANTONIK: Let's play now. But let's not play altogether because we get too noisy. That's what mother said. So those who want to do something will just do it and we'll all watch.

ANKA: That's a good idea, Antonik! Now, who's going to be first?

WENCLOT: I bet I can jump higher than Antonik!

ANTONIK: All right; we'll see; you try first. *[Wenclot jumps twice—as high as he can.]* You jumped two times, can I too?

WENCLOT: Well, I have to, because I can always jump higher the second time. Do you have to jump twice, too?

ANTONIK: No, I'll try just once. *[He does, but not as high as Wenclot.]*

CHILDREN: Jump again, Wenclot! *[He does so, children clap hands.]*

IVAN: I guess you do jump high for a little fellow like you.

PETRO: I'll sing a song.

IVAN: Good!

ANKA: All right. *[Petro sings a song and sound of singing is heard outside, before he finishes.]*

IVAN: Oh, there are some children singing outside. They must be cold. Call them in to

warm up and have them sing for us. [*Children make room.*]

ANKA: Oh, singers, come in here and warm up. [*Sound of many stamping feet, singers come in.*]

LEADER: Many thanks for inviting the Russian Carolers.

CAROLER 1: That's what we call ourselves.

CAROLER 2: My, but there are a lot of children here; is this an orphanage?

ANKA [*careful in her speech*]: No, but I am taking care of these children tonight.

CAROLER 3: Are you all Catholics here? [*The children nod their heads.*]

CAROLER 4: We can only sing near the Catholic places and we haven't sung in very many places yet.

LEADER: Maybe you want us to sing some of our songs. [*Sing "Adeste Fidelis" and "While Shepherds Watched their Flocks" 2 stanzas.*]

CHILDREN: Oh, that's fine! It sounds so good! Sing some more!

LEADER: No, we must go now. We're afraid of the police and we've got to be careful. Good night. May the dear Christ Child bless you.

[*During the singing some of the smallest children have gone to sleep on their blankets.*]

ANKA: Poor little ones! I must go and wrap them up. [*She does so, Jan and Ivan help her. The others sit on their blankets and hum "Silent Night."*]

LENA: I think we had better think of going to sleep, too. I'm tired and you all are, too, aren't you? [*They nod, some say "Yes" etc.*]

CARL: Who's going to stay up?

IVAN: I am. I am watchman tonight.

ANKA: Let's sing our hymn and say our prayers, then go to sleep.

[*Sing "Good Night Sweet Jesus" and "Jesus, Teach Me How to Pray," then pray silently. One by one they retire to their blankets to the back of the stage as much as possible. Anka goes to the stove and seeing that everything is all right, lies down. Ivan has gone out—lights are dim.*]

Curtain

### Act III

[*Same scene—all sleeping. Angels come in led by the leader, a pretty formation may be presented if the leader is a larger angel and the rest coming by twos are graduated in size. The leader with hands crossed on breast comes to the front, the next two go to the sleeping Anka and after a gesture of blessing come to their places next to the leader, left. Then when the others have slowly taken their places to the front, they sing sweetly "Gloria." Then led by the leader they slowly go out humming the melody of "Gloria." Soft knocking is heard at the door. Anka half rises. Knocking is heard again. Anka calls softly "Ivan," no answer, she gets up and goes to the door. Voice of stranger says, "Please, let me in."*]

ANKA: Who are you? [*She opens the door. She sees the Child.*] Come in, you poor little child! [*she brings in the stranger*] How cold you are! Come sit by the fire and let me rub your hands. You have so few heavy clothes on! And you are nearly frozen. [ *rubs his hands*] You poor, poor dear! How did you get lost? Where are your father and mother? Come eat some of this porridge, you're nearly starved, I know. Poor little one and on such a night, Christ's blessed night. Do you know, it is the night that Jesus was born in Bethlehem. He was cold too, and no one was kind to Him, but I would have liked to care for

Him. You are hungry, aren't you? Eat well, and then you may come and sleep on my blanket.

[*Low talking outside and parents enter dejectedly, Jesch comes in first.*]

JESCH: The little ones are asleep and they know not of our big disappointment.

MOTHER: My dear Anka, are you still awake?

ANKA: Oh, mother why do you look so sad? What has happened?

[*The children, little by little, start to awaken, take their places near their parents and hide the stranger child. Some of the neighbors take chairs, others stand dejectedly.*]

MRS. BRO.: Ah, Anka, may misfortune not follow us always; we did not hear Mass.

CARLOVITCH: Yes, but how terrible it will be for that poor priest. [*Ivan enters.*]

IVAN: What is this I hear, father?

FATHER: Ivan, we did not hear Holy Mass. We are not yet worthy enough. Oh, how much would I not give, now, to hear well, one Holy Mass. Why did I not do so more often when I was a young man and could do it so easily. God be merciful to me!

CARLOVITCH: Me, too, neighbor. If we had only known! And to think that in so many other lands there are Holy Masses going on all the time. How they should love Christ!

ANKA: But, tell us, what was the matter!

FATHER: Oh, Anka, the police caught the priest, in a village down the river, while he was hearing a dying man's confession, and tonight we don't know where he is. God help him!

IVAN: If only the Christ Child would help us, now.

[*At this all turn to the stranger who has been transformed into the Christ Child.*]

CHRIST CHILD: I am with you and to show that I appreciate your good will, I will take you back to that first Christmas Night.

Curtain

### Act III Scene II

CRIB SCENE: Christ Child, Blessed Virgin Mary, St. Joseph, Angels sing "Gloria." Neighbors with their children are arranged around the crib. Enter Shepherds. Soft music may be played.

HERALD: Here come lowly shepherds to the Crib of the Saviour.

SHEP. 1 [*to Herald*]: Here He is of whom the Angels sang!

HERALD: Come close to the Child.

SHEP. GIRL: What a lovely Child! I have brought a blanket for the Little Babe.

[*Shepherds take places around crib.*]

HERALD: Dear Mary, here come three kings from afar. They desire to see your sweet Babe. [*She nods.*]

[*Kings enter each with a page carrying the gift on a pillow. The kings sing "We Three Kings" then take their places. Anka comes to center of stage and kneels before the Crib.*]

ANKA: O Mother Mary, pray for Russia and for all who do not believe in your dear Son and God.

### Tableau

a a A a a  
a a K V X a a  
a a a N N N a a a  
a F S Crib K N  
a N M S K S P P a  
a a a K H a a a

V—Blessed Virgin Mary P—Pages  
X—St. Joseph F—Father

K—Kings  
A—Large angel  
a—Small angels  
H—Herald  
S—Shepherds

M—Mother  
Anka  
Ivan  
Jan  
N—Neighbors  
and their  
children

## A Valence Chart for Chemistry

Sister M. Gabriel, O.P.

A valence chart in the chemistry exhibit was composed of cards on which were written chemical formulas which were visualized by graphical representations made of candy gumdrops to represent the atoms of elements and the radicals of intact compounds. The valences (bonds) were toothpicks.<sup>1</sup>

For the device we used every color and every size of gumdrop procurable from the confectionery. With some regard to grouping (but not for accuracy) we selected: the smallest gumdrop to represent Hydrogen (approximate atomic weight—1); the largest gumdrop to represent Radium (approximate atomic weight—226).

The other elements were assigned gumdrops in size proportional to atomic weight.

The radicals were represented by gumdrops cut and superimposed.

In the monovalent group one toothpick connected two elements. Example: Hydrogen chloride. But by the dualistic system, according to which the elements combine in couples the number of atoms in the formula is in proportion to the total valences of the united element (or elements) or radical.

It is very important that the pupil should have a mastery of the theory of valence. In his *Diagnostic Study of Pupil Difficulty in Chemistry*, S. R. Powers states that on the standardized test in the writing of formulas the pupil generally fails. This may be attributed to a poor comprehension of valence.

<sup>1</sup>Gumdrops and toothpicks were chosen merely because they were readily available.

## World Peace

"Never before has the paradox been presented of an almost universal desire for peace and at the same time an apparent inability on the part of the nations to do the things that make for peace.

"Our task is to do more than guarantee the status quo. We must remedy the conditions that make for war; and we must remove the causes of war.

"If the present League of Nations has failed, another and better league must take its place, a league which shall apply the principles of Christian morality to the relations of nations and which shall give stability to the international order by the promotion of justice."

These words were part of an address on "The Moral and Legal Basis of International Peace," by Dr. Charles G. Fenwick, professor of political science at Bryn Mawr College and president of the Catholic Association for International Peace, at the commencement exercises of Mt. Mercy College, Pittsburgh, Pa.

# Practical Aids for the Teacher

## TREES

### A 12-Week Unit for Intermediate Grades

Sister Frances Jerome, C.D.P.

#### PART II: FURTHER DEVELOPMENT

When we began the study of maple sugar, a chapter from Warren's *Little Pioneers*, entitled "A Store of Sweets," was read from our fourth reader concerning the methods used by the Pilgrims to obtain maple sugar. This reading directed our unit in another channel; namely, what other things the Pilgrims obtained from trees. Although this was a deviation from the unit proper, it was in keeping with the season and strongly appealed to the children. We decided to get the book *Little Pioneers* from the library and read the entire story with this object in view. As this proved very interesting, parts of it were dramatized, though in most instances the dialogues were not taken directly from the book but came spontaneously from the children. The study of particular trees by the individual pupils still continued, however, and interest was stimulated by oral reports and the compilation of work. This phase of activity was finished at the end of November.

#### Related Activities:

1. Collection of pictures, articles, and poems concerning the Pilgrims.
2. Making a small log house such as the colonists built containing furniture.
3. Collection of scenes typical of New England life.
4. Making dolls from wire and crepe paper to represent Pilgrims.
5. Fixing a sand table depicting the landing at Plymouth.
6. Making a poster, "In Pilgrim Hall," showing the cradle of the first white child and the sword, pot, and platter of Miles Standish.
7. Dramatization of *Little Pioneers*.
8. Making a poster of Squanto showing the Pilgrims how to get maple sugar.
9. Maintaining an interesting bulletin board.

#### Curriculum Activities:

##### Religion:

Instances in the New Testament where trees played an important part were noted. The shelter of the Holy Family was derived from trees. Trees also furnished them a means of livelihood since St. Joseph was a carpenter. When Our Lord began His public ministry trees often aided Him in preaching the gospel, as for example, the occasion when He preached from a boat because the multitude was pressing. The fig tree and the mustard seed were also used in parables. However, the greatest service of trees to mankind was that they helped effect our redemption since Jesus died on the cross. Worth-while lessons were also taken from the example of the Pilgrims. Their spirit of self-sacrifice was shown in the hardships they embraced in order to worship God. Several times during the course of the month a pupil was heard to remark, "And the Pilgrims did all that because they loved God!"

##### Geography:

A study of the New England States was made. Comparisons between the New England

of today and that of 1620 were made. Our Dixie Workbook gave splendid pictures and suggestions on how to correlate the Pilgrims with New England. True-and-false and completion tests from the workbook served as a check on our knowledge.

##### Spelling:

The following words were those most frequently used and consequently those taken for spelling. Several common names are included because most of our information was obtained from *Little Pioneers*.

puncheon	wheel	spinning
Holland	Plymouth	Pilgrims
England	cradle	Atlantic
Mayflower	brooms	Squanto
Priscilla	Indians	hospital

##### Language:

Work was completed on the section "Trees We Know." When information on the particular trees was almost exhausted, interest waned. It seemed wise to bring this activity to a close. Each pupil brought all the material he had collected and it was put on exhibition. The work of the individual pupils was evaluated by the class. A game was played, the boys versus the girls, to see which group was more familiar with the trees studied. Mounted specimens of leaves were held up and the sides took turns in saying a complete sentence about the tree the leaf came from. Riddles concerning different trees were also used in a similar game. A new division of our booklet, "What Trees Gave to the Pilgrims," was

developed. The contents of this section consisted of stories and illustrations chiefly relating to the instances shown in the large posters. Work was continued on the poetry and song sections. The child impersonating Love Brewster in the playlet proudly announced to the class that he had composed a poem about himself. He then recited the following:

In 1620 the Pilgrims came.

They had no fun—like a game,  
But all was so sad on the great big boat.  
That the pretty Mayflower could hardly float.

But one day Love, a little boy,  
Went out on deck and said, "Joy! Joy!"  
He went to his father and then he said,  
"Oh, father, I see land ahead!"

##### Art:

During November we decorated the room with four large posters depicting the service of trees to the Pilgrims. This afforded practice in letter cutting. A sand-table scene, smaller posters and illustrations were also done during the art period. A border of maple leaves was made from tinfoil and cellophane. The leaves were cut from construction paper and covered with small pieces of different colored tinfoil to represent the autumn colors. This in turn was covered with cellophane and pasted to the back of the leaf. This made an attractive and brilliant border. Plain tinfoil and colored tinfoil will give the same effect. This combination may be used on the January sand table to represent an iceberg, for a border of hatchets in February, and in many other instances.

##### Singing:

The introduction to the playlet was put to music and sung. Other songs learned from our music text were "Naming the Trees," "The Leaf and the Bird," "What Do We Plant," and "Forest Peace."

## What Trees Meant to the Pilgrims

### (A Playlet in Three Acts)

Sister Frances Jerome, C.D.P.

#### PRELUDE

We're here today to show you  
In a very simple way  
What trees meant to the Pilgrims  
When they came here to stay.

You'll see them on the Mayflower  
And in their little homes,  
With spinning wheel and cradle  
And fire lit from flint stones.

You'll find them very thankful  
For all God's lovely gifts—  
The trees, the land, and cradle  
In which Oceanus sits.

#### Act I

SETTING: Aboard the Mayflower. An easel blackboard covered with brown paper was used for the cabin. The foreground represented the deck. A cardboard rail was placed along the front to give a more realistic effect. Priscilla and the children are on deck when the curtain rises.

LOVE: Oh, if we could only reach land!

CHARACTERS: Children—Love and Wrest-  
ling Brewster, Bart, Remember, and Mary  
Allerton, John Billington, Ellen More,  
Damaris Hopkins, and Resolved White.

Men—John Alden, Governor Carver, Elder  
Brewster, Captain Standish, and a Sailor.

Women—Priscilla Molines and Mistress  
Brewster.

Indians—Squanto, Massasoit, and Samoset.

COSTUMES: Women and girls dressed in  
Puritan style, long full gray skirts, white col-  
lar, cuffs, and apron. Men and boys in knickers  
with collar and cuffs made from white paper.  
Buckles for the shoes and hats were made  
from cardboard and covered with tinfoil.

ADAPTIONS: As no hall was available for  
our play, the number of characters on the  
stage at a time was necessarily limited. If  
desirable, more characters can appear though  
they need not have speaking parts. If fewer  
characters are preferable, the parts of some  
of the children may be eliminated by trans-  
ferring the speaking parts to a few. An Indian  
dance, songs, and recitations about trees would  
be appropriate between acts.

BART: I do not believe we shall ever get off this old water! [*Damaris cries.*]

PRISCILLA: Hush, children, and have patience.

LOVE: But, Priscilla, I have no room to run.

REMEMBER: And everybody looks so sad. The ship may be going to sink.

PRISCILLA: Nay, nay, our elders always look sad.

LOVE: Except you, Priscilla.

PRISCILLA: Now, I'll tell you a secret.

ALL: What is it?

PRISCILLA: God has sent us a gift.

WRESTLING: Oh, is it something to eat?

PRISCILLA: No!

BART: I'd rather have something to eat — a big fruit pudding!

JOHN B.: Oh, I could eat three all by myself.

PRISCILLA: Don't be greedy, John. Listen! [*A whining sound is heard.*]

BART: It's the wind.

WRESTLING: It is a cat. [*All laugh.*]

PRISCILLA: Go and ask Mr. Hopkins to show you the gift. [*All leave but Priscilla.*] At least we have a cradle for little Oceanus. Thanks to another gift of God — the trees!

WRESTLING: Oh, Priscilla, we saw the baby!

LOVE: Baby Oceanus isn't English or American. It is strange to be born on the sea. He doesn't belong anywhere.

BART: Yes, he does. If we are nearer England, he's English and if we are nearer America, he's American.

LOVE: Come, let's go see if we are near land!

BART: It's no use! I'm tired of straining my eyes. [*Love walks off talking to himself.*]

LOVE: If there's land, I could see it first because I'm far-sighted. [*After a pause.*] I do see something! [*Runs to his father.*] Oh, dear father, may I speak to you?

ELDER BREWSTER: What is it, child?

LOVE: I see land. Let me tell the Captain I see land!

SAILOR: Land, ho!

WRESTLING: God gave us two gifts today — the land and little Oceanus. [*Children look toward the land.*]

LOVE: Oh, Priscilla, I think I see some trees, real trees!

PRISCILLA: Yes, if it weren't for trees we would never have had this ship to reach our new home.

LOVE: That's right! This ship was a tree once, wasn't it?

BART: It took more than one tree to build this ship.

MARY: Let's count all the things we get from trees in our new home.

PRISCILLA: That is a good idea, Mary. And remember that trees are one of God's greatest gifts to us.

JOHN: When I get on land I'm going to climb every tree I see.

BART: I'm going to hunt nuts.

DAMARIS: Will there be any fruit trees?

JOHN B.: You had better be careful about looking for things. You might find bears and lions. [*Grows to frighten Damaris.*]

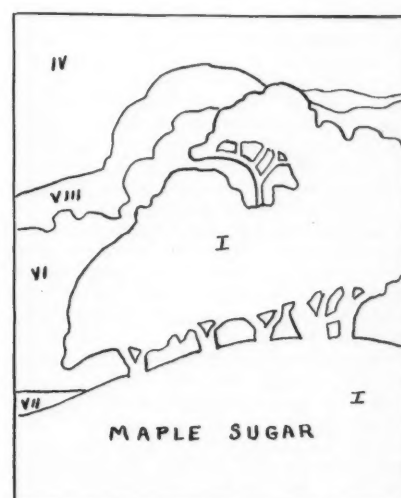
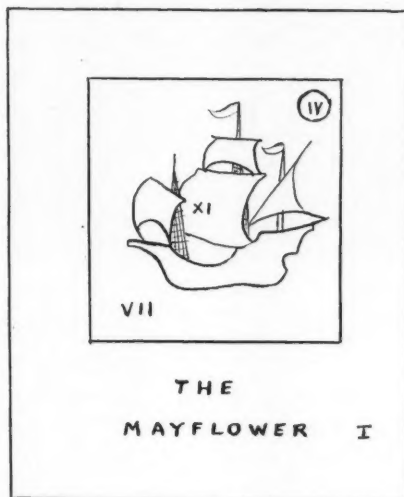
PRISCILLA: If you can't do any better than that, go to bed! [*John leaves sulking.*]

[*Mistress Brewster enters with John Alden.*]  
MISTRESS BREWSTER: Some of the men are going on shore tomorrow to bring fresh water and wood.

BART: Why can't we go too?

PRISCILLA: You should think before you speak. We must find what the land is like first.

## WHAT TREES GAVE THE PILGRIMS



Directions for Coloring: I. Medium Brown. II. Dark Brown. III. Light Brown. IV. Orange. V. Red. VI. Medium Blue. VII. Dark Blue. VIII. Yellow. IX. Medium Green. X. Dark Green

LOVE: It will make us so glad to get a home of our own that we will soon be rich.

MISTRESS BREWSTER: You know we are all very poor, Love. Your father was rich in Scrooby, England, but when he went to Lienden, Holland, he worked hard at printing.

MARY: I remember, and Mr. Bradford made cotton cloth and Resolved White's father carded wool.

JOHN ALDEN: And I made wooden barrels. Now, I must make houses and dig fields.

MARY: Oh, Priscilla, that's another thing the trees are going to give us — our homes!

(*Curtain*)

### Act II

SETTING: Inside the Brewster cabin. The fireplace consisted of a wooden frame covered with cardboard packing boxes. The cardboard was painted gray and the stones outlined in black crayon. The interior of the fireplace was blackened to give a smoke-stained appearance.

A ladder in one corner was supposed to lead to the loft. A little cradle with a doll, a broom made from dead rushes tied to a handle, a table, and two stools constituted the remaining furniture. Love, Mary, Wrestling, Mistress Brewster, and Priscilla are on the stage when the curtain rises.

LOVE: Look at our nice hearth and someone has built us a fire.

MISTRESS BREWSTER: See, children, our fine table, our bench, and the two stools.

WRESTLING: Where does the ladder lead to?

MISTRESS BREWSTER: To the loft where Priscilla will sleep.

MARY: Oh, Love, nearly everything in here comes from the trees. Let's count! [*Points to articles.*]

LOVE: I'll beat you yet, Mary. I know we will get many more things we need from trees and I'll count first.

PRISCILLA: Now, no arguing! Look, Love, how untidy this earthen floor is. But at least

I shall have it neatly sanded. Go, run to the shore and bring me a pail of sand.

MARY: It ought to be a puncheon floor like the one in the common house.

LOVE: That's one thing you didn't think of the trees giving, Mary!

BART: [*Looking in at the door*] John Alden is going to the woods to find brooms. He told me we could help if we could be spared.

LOVE: [*to Mary*] Brooms from trees! Count two, Mary! [*Goes to Mistress Brewster*] Mother, may I please go with Bart?

MISTRESS BREWSTER: Yes, Priscilla and I do not need you right away. But be on time for dinner.

PRISCILLA: Oh, here comes Captain Standish and the Governor with Elder Brewster.

MISTRESS BREWSTER: My! And hardly a thing in order; [*The three enter.*] Welcome Governor! Welcome Captain! We are well pleased with our new homes. [*Captain greets Priscilla while Governor and Elder go aside talking over some documents. Mistress Brewster fixes broth at the fireplace. Mary runs outside.*]

PRISCILLA: Oh, Captain, sit down and tell me about your adventure with the Indians. I was absent when you told it before. [*The two sit on the stools.*]

CAPTAIN: Very well, Priscilla. One night during our absence we were awakened by a terrible cry. One of the sentinels said it was a fox. The next morning we heard the cry again—Woach! woach! ha! ha! woach! [*Captain imitates the sound while Priscilla shivers.*] One of the men shouted, "They are men! Indians! Indians! The arrows began to rain but we couldn't see the Indians. Then we ran to the boat for our arms. I made one shot and then another man shot. We knew we must frighten the Indians. Finally, I saw one Indian raising his bow to shoot. I fired and the ball went into his arm. He shrieked and ran with all the other Indians following. We called this place "The First Encounter" because it was here we met the Indians face to face. [*Love enters all excited.*]

LOVE: Oh, father! Oh, Governor! An Indian! An Indian!

ELDER BREWSTER: Child! This is no way to enter! [*In the meantime the Governor goes to the door and returns.*]

GOVERNOR: It is indeed an Indian. We must not let him know how few we are in number. If the Indians knew our weakness, they would attack us.

CAPTAIN: Let us go and greet him in all kindness. If he doesn't understand English, he will at least understand gestures of peace. [*All go to greet the Indian but Love and his father.*]

ELDER BREWSTER: Come here, Love.

LOVE: Yes, father?

ELDER BREWSTER: Go to the common house and get something for this Indian to eat.

LOVE: Yes, father. May not Bart come with me? The Indian looks as if he would eat more than one boy could carry. [*Bart appears in doorway.*]

ELDER BREWSTER: [*to Bart*] Go, then, Bart. [*The children leave just before the men re-enter with an Indian.*]

GOVERNOR: [*to Indian*] You are the only Indian who has visited us. Why is that? Are they afraid?

SAMOSSET: I do not speak much English, but I will try to tell you. The Indians were very many, like the sands on the beach. Then came a great sickness. It swept them away as water sweeps the sands.



GOVERNOR: And so they died?

SAMOSSET: All but a few, and those went away. They left these good lands because they were afraid. I bring Squanto to teach white men.

CAPTAIN: Are there others with you?

SAMOSSET: Massasoit with Samoset and Squanto. Massasoit big chief. [*Samoset goes to the door and gives a sign at which two Indians enter.*]

MASSASOIT: Massasoit and his tribe friend of English. [*Hands bow and arrow to Governor as a sign of peace.*]

CAPTAIN: When we first came some Indians shot arrows at us and might have killed us. I trust they did not belong to your tribe.

MASSASOIT: Those were the Nausites. They are angry because a white man stole some of their men and sold them as slaves.

ELDER: Here comes Love and Bart. Let us go out to the big table where we will have more room.

MASSASOIT: And smoke peace pipe.

*Curtain*

### Act III

SETTING: In the open. Wings portraying a forest scene were used. If these are not available, the children may make some. If desirable, children dressed as trees may represent the forest. The children are playing games.

JOHN B.: I wonder if it is warm enough to take off our shoes and stockings?

BART: I fear not. And yet I scarcely dare walk in my shoes. I think every minute they will fall to pieces.

LOVE: John Alden says he will make us some shoes, but he is no shoemaker.

JOHN B.: Nor was he a house builder and yet he has helped make houses.

MARY and ELLEN [*Run in excited*]: Squanto is coming! [*Squanto enters.*]

ELLEN [*to Squanto*]: Let's get some more maple sugar sometime.

LOVE [*to Mary*]: Count three, Mary! You didn't think of the trees giving sugar.

MARY: Well, I'm still ahead! Squanto, show us how to make some more things, will you?

SQUANTO: No school today?

RESOLVED: No, Priscilla gave us a holiday. The women wanted us out of their way while they fixed the big dinner.

JOHN B. [*accusingly*]: Say, Squanto, did you tell Priscilla how to get ink by boiling the bark of the swamp maple and putting coppers in it?

BART: And how did she know that birch bark could be used to write on?

LOVE: Count four and five on paper and ink. I'm even with you, Mary!

JOHN B.: What are you talking about?

REMEMBER: He's counting the things trees give us. Don't you remember?

DAMARIS [*shyly*]: Let's make some more maplewood dishes, Squanto.

MARY: Count six! I'm ahead!

SQUANTO: You were talking about shoes when I came. Come and I'll show you how to make little shoe pegs.

ELLEN: They'll have to be smaller than the pegs the men used for nails when they were building.

LOVE: Pegs! Count six for me, Mary!

JOHN B.: Now you are even so be still! [*Motions to side of stage.*] Oh, Squanto, look!

SQUANTO: Yes, they are the Indians coming for the big dinner. They bring venison and oysters. Go, tell your mothers. They will need you now!

JOHN B.: Thanksgiving dinner! Oh! Oh! (*Curtain*)

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## Outline for Study of the U. S. Constitution

Sister M. Consilia, O.P.

### Introductory Problem

As a preliminary movement, the teacher should determine what amount of background the children have had on the Constitution. It is expected that children having completed the seventh year will be familiar with such historical points as the time, place, circumstances, and need for drawing up the Federal Constitution. They know, usually in a vague way only, what a constitution is, and just as vaguely, the points which a good workable constitution ought to include. These things the teacher should clarify and provide instruction if necessary. Previous attempts at constitution making (especially in respect to the American Colonies), should be included in the preliminary discussions or suggested as topics for research or reading.

### Problem One: Our Workable Constitution

- A. What a Constitution is.
  - B. What a satisfactory Constitution ought to contain.
  - C. The form and functions of the government provided by our Constitution.
    1. Form — Republican
    2. Functions — Tripartite
    3. In what the tripartite government consists
  - D. An overview of the three departments in general in respect to their subdivisions and personnel.
  - E. Slight overlapping of the three functions of government.
- The three functions of government are kept almost entirely distinct, though some slight overlapping exists, which is not commonly reverted to by the ordinary citizen.

### Problem Two: Becoming Familiar with the Plan Outlined in the Constitution

**Objectives:** An understanding of the form of government under the Constitution of the United States:

- The historical background of the Constitution;
- The Divisions and subdivisions of the Constitution;
- What, in general, the Constitution says about the various phases of government and the governed.

### Problem Three: Why the Constitution was Written

The Preamble or Introduction to the Constitution expresses the purposes or objectives of the Constitution.

### Problem Four: The Three P's of the Constitution — Privileges, Powers, Prohibitions

- I. *Privileges Guaranteed by the Constitution*
  - A. Of the People.
  - B. Of the States.
  - C. Of the United States.
- II. *Powers Granted by the Constitution*
  - A. To the People.
  - B. To the States.
  - C. To the United States:
    1. Peace powers
    2. War powers
    3. Implied powers
- III. *Prohibitions Imposed by the Constitution*
  - A. Upon the People.
  - B. Upon the States.
  - C. Upon the United States.

**EDITOR'S NOTE.** This is a syllabus for the study of the Constitution and the organization of the Federal Government. The student should always check against the Constitution itself any claim of power which is claimed exists there. This outline contains a number of interesting facts that will help the teacher to fill in the framework provided in the Constitution itself.

### Problem Five: The First of the Three Departments (in detail)

#### I. *The Legislative Department*

- A. Of What It Is Composed.
- B. General Provisions Regarding the Legislators.

- How chosen; When chosen; Term; Number; Age; Citizenship; Residence; Oath; Restrictions; Special privileges; Salary; Vacancies; Presiding officer; Disputes.
- C. The Houses Taken Together.
  1. Sessions:
    - a) Regular
    - b) Special
  2. General duties
  3. Special powers exercised conjointly
  4. Powers special to the Senate
  5. Powers special to the House of Representatives
  6. General powers (outlined under Problem Four, II Powers)

The tax powers may well be pointed out again, since by it the means to meet expenses of the Government are provided. How Congress may raise money. How money raised by Congress may be used.

### Problem Six: The Second Division of Government

#### I. *The Executive Department*

- A. Of What It Consists.
- B. General Provisions Regarding the President.

Qualifications: Birth, age, residence.  
Manner of Election: Ordinary, extraordinary.  
Oath, Term, Vacancy.  
Duties and Powers: (1) General, (2) Special.

#### C. Provisions Regarding the Vice-President.

Qualifications: The same as for the President.

Duties: (a) General, (b) Special.

#### D. Provisions Regarding the Cabinet Members.

1. Number of Secretaries
2. Field of activity
  - Secretary of State
  - Secretary of Treasury
  - Secretary of War
  - Attorney-General
  - Postmaster-General
  - Navy
  - Secretary of Interior
  - Agriculture
  - Commerce
  - Labor
3. Appointment
4. Term

### Problem Seven: The Court System Established Under the Constitution

#### I. *Superior and Inferior Courts*

A. Superior Court: Personnel, Term, Appointment, Quorum.

Jurisdiction:

- a) Original
- b) Appellate jurisdiction
- c) Action of the Supreme Court in those cases in which it has appellate jurisdiction

d) Power to declare laws unconstitutional  
N.B. The children must understand that the Supreme Court does not pass judgment on all the laws of Congress; it decides about a law only when some person or group of persons demands it.

The best method of approach in these questions of the jurisdiction of the Supreme Court is to study and discuss the various activities of the Court in its recent and contemporary decisions.

#### B. Inferior Courts:

Names:

Jurisdiction of Inferior Courts.

The United States Circuit Courts:

Number  
Specific jurisdiction

The United States Circuit Courts of Appeal:

Number  
Specific jurisdiction

The United States District Courts:

Number  
Specific jurisdiction  
Tenure of office

**Objectives:** From problems three to seven the children ought to derive a fairly accurate knowledge of why we have a Constitution, how the powers of government are distributed among the three divisions with but very little overlapping, and in what respects one department of government acts as a check upon the other, or provides a balance in the powers granted.

The children should understand that our system of government is a system of checks and balances, and they should be able intelligently to indicate in what respects this is so.

From constant references to the text of the Constitution, a familiarity with its divisions and its wording ought to be attained.

They should realize, too, that it is the people who govern because:

1. The Constitution was made by representatives of the people.

2. The laws are made by Congress, whose members are elected directly by the people.

3. The president and vice-president are elected by the people (indirectly) through electors whom the people choose.

4. Through political parties to which they belong, the people impress principles on the public policy of the country.

From the study of problem four, *The Three P's of the Constitution*, the children should be very well versed in the contents of the first ten amendments to the Constitution, commonly known as the Bill of Rights.

### Problem Eight: Our Constitution and the Citizen

In discussing the Three P's of the Constitution, much was said concerning the privileges, the rights, and prohibitions of the Private Citizen in respect to the Constitution; therefore Problem Eight will merely re-open these points for discussion while it sets forth hitherto unmentioned relations existing between each individual and his system of government.

Review the salient features of the Bill of

Rights in order to recall what the Constitution has to say about the private citizen. Discuss the meaning of the term "Bill of Rights."

Why and When adopted as part of the Constitution.

In addition to the Bill of Rights, certain other amendments to the Constitution make statements regarding the individual. Among such references we find the following:

1. Who are citizens (Amend. xiv)
2. Concerning work (Amend. XIII)
3. Voting (Amend. XIX, XV)
4. Holding office
5. Taxation (Amend. XVI)
6. Regarding arrests

#### Problem Nine: Our Growing Constitution

Our Constitution, like our nation, is always growing, always changing. The flexibility of our Constitution accounts, to a great extent, for the success of our government. Problem Nine will be devoted to how changes may be effected in our Constitution, and what changes have been made since the adoption of the Constitution over one hundred fifty years ago.

- I. What an amendment to the Constitution is
- II. Manner laid down by the Constitution for making amendments. Cf. Const. Article V
  - A. How proposed
  - B. How ratified
- III. Number of Amendments made to the

## Leaf Printing

Sister Casimir, O.S.U., M.A.

It is rather difficult to make a good permanent collection of leaf specimens, as leaves, no matter how well dried, shrivel up changing their outline and shape, require delicate handling and even with the best of care are not usable after several displays. Below are simple directions for making leaf prints which look like masterpieces of pencil drawings, at the same time portraying accurately the outline and veining. These leaf prints are so easy to make that my pre-convent camp children ranging in age from eight to fourteen used them in their attractive nature-study booklets, and they were so satisfactory that all the college botanical classes that I teach make use of leaf printing. Ferns print exceedingly well, and with a little practice flower prints also may be made by this method.

#### Materials:

Fresh and perfect specimens of leaves to be printed; pieces of cardboard such as tablet backs; lard or any semisolid fat; candle; matches; newspapers or magazines; paper for printing—this may be any paper you wish, such as poster, notebook, drawing paper, etc.

#### Method:

1. Spread lard very thinly and evenly over one side of a piece of cardboard. Hold this side down on the candle flame, moving it about until a good even layer of soot is deposited over the greasy surface.

2. Select a specimen of a leaf as nearly perfect as possible; i.e., one with a distinct outline, free from cuts, insect bites, galls,

present time, and the reason for their adoption

#### IV. The Content of the Several Amendments

Since the first ten amendments were studied under the privileges of the people, it will not be necessary to include these amendments in Problem Nine, except in a deliberative way.

By comprehensive planning, the teacher will be able to cover the content of all the amendments to the Constitution in the previous problems, excepting the Eighteenth and Twenty-first amendments.

There remains then, for consideration, only amendments XVIII and XXI. These two amendments may be studied together because of the very affinity between them.

The point of discussion in this matter is the manner in which an unfavorable law may be repealed. Once a bill has been passed, it requires the passage of a new bill to remove unfavorable legislation from the statute books. This point may be illustrated very clearly in the study of the Prohibition Amendment and the repeal of Prohibition.

#### Problem Ten: General Provisions and Ratification of the Constitution

##### I. The Supremacy of the Constitution

##### II. Oath to the Support of the Constitution

##### III. Religious Test

##### IV. Ratification of the Constitution

**Objectives:** From Problems Eight through Ten, the children should acquire a comprehensive knowledge of their rights and duties under the Constitution, the equality of those rights and duties with all other citizens, and the privilege provided by the Constitution itself to the citizens, that of altering or abolishing the very instrument of our present national unity.

etc. Lay the leaf *face up* on the blackened cardboard. This will bring the prominent veining of the *underside* of the leaf in contact with the soot.

3. Cover the leaf with a sheet of paper, a piece of newspaper or a magazine page. Magazine paper is better than newspaper, as the print of the newspaper sometimes rub off.

4. With your finger tips "feel out" the stem, the veins, and the outline of the leaf under the paper, and rub these parts well.

5. Lift the leaf carefully and note whether all the veins have been well blackened. If not, repeat part 4.

6. Pick up the leaf and place it *carefully*, blackened side down in the exact position on the sheet you wish the print to be. Cover with a clean piece of magazine paper.

7. Repeat step 4 using *extreme care* as the slightest move of the leaf under the paper will cause a blurred print.

8. Using the same care take off the paper and lift the leaf. Save the top paper for part 3 for the next leaf.

9. Lay the print aside until dry.

10. Label, giving all the required data.

As you see the materials are readily obtained by anyone, anywhere and the process is very simple. The same cardboard may be used until worn out. Blacken or grease it as often as you wish. Try it yourself, and try it with your pupils. This may be just the thing to create interest in and the desire to know more about Nature.

## Lessons on Marriage

Sister Cecilia, O.S.B.

### UNIT III: THIS PICTURE HAS LIFE AND POWER

#### Exploration

1. You learned in Unit II that a Christian marriage is as indissoluble as the union between Christ and His Church. Has God made any provision for giving married persons extra help to live up to the duties required of them by the married state?
2. Where do they get this extra help? (In the sacrament of matrimony.)
3. What does the word sacrament mean?
4. What is the "visible sign" of this sacrament of matrimony?
5. What is the invisible grace imparted?
6. What is the priest's part in administering the sacrament of matrimony?
7. Can the sacrament of matrimony be received by one of the parties if the other is not a Christian?

#### Presentation

In calling Christian marriage a *picture* of the union between Christ and His members, we are forced to use a very imperfect figure. For the most beautiful image in the world is something of itself lifeless and inert, while, on the other hand, Christ has by His omnipotence the power to breathe into Christian marriage a share in His own divine life, so that the picture itself becomes vivified and vibrant with the overflowing abundance of God's ineffable "aliveness." You know what a transformation is sometimes wrought in dull metal by passing through it an electric current, which makes it glow and vibrate with a "life" it does not otherwise possess. So it is with Christian marriage; it too is caught up into the current of grace and love, which always circulates between Christ and His Church and back again to its source in God. And lo! what would have been a purely natural contract is set aglow by the supernatural current of divine life, by which it is permeated and quickened.

Moreover, just as an electric current gives power to the inert coil of wire, so that it possesses all the vast mechanical energy of, for instance, an electric motor; so the current of life and love passing through Christian marriage imparts to it not only supernatural "aliveness" but also the marvelous power needed to fulfill all the functions proper to the married state and to endure all the storms and vicissitudes which destiny holds in its store. For, by reason of the mystical marriage, in which man and wife share, their souls are permeated and quickened (1) by the life of Christ through sanctifying grace and (2) by His power, in all the actual graces imparted according to their need along life's journey.

By what sign do we know that this is true? Deriving through sense perceptions all our knowledge—even the truths of faith—what assurance have we that God is thus working invisibly among us? The fact that marriage is a sacrament is the highest guarantee we could possibly have of its efficacy. For what is a sacrament but an infallible sign that Christ Himself stands behind the veils of the outward ceremony and truly imparts His efficacious grace? Only in the case of the sacrament of matrimony alone, instead of the ordained priest being the official channel of grace from Christ to man, the bride and bridegroom, by reason of their "lay priesthood" derived from baptism, receive the

sacramental life directly from Christ's humanity, without priestly mediation. "The gift of self carries with it the gift of grace, and the giver of self is the minister of the grace." And so "the very plighting of their troth brings grace from heaven" (7:343).

Not that the presence of the priest is unnecessary, however. Since every marriage contract, to be valid, must be made in the presence of at least one witness; so the Supreme Witness of every marriage, the most interested Party, God, without whom the other two "parties" could not exist, stands invisibly by to ratify the contract. Therefore, He must needs have a proxy, His minister, to give that ratification visible form. To ignore the importance of God's representative, then, would be to slight the very Author of life. That is why Church law is so insistent on the ceremony being performed in the presence of her ministers as to consider invalid a contract made by her members without good reason under other circumstances.<sup>1</sup>

It also follows, from the essentially Christian nature of marriage, that the sacrament can be imparted only when both parties are validly baptized; that is, are members of Christ (12:28). Otherwise the symbol were incomplete. For how could that supernatural electric current of love and grace, which we described above, pass through a marriage in which one of the parties was dead supernaturally, that is, incapable of receiving an influx of life beyond his (or her) receptive capacity? But when two living members of Christ pledge their troth in faith and love to God and to each other, there takes place a greater miracle than any ever wrought before our outward senses; for man and wife are caught up into the sphere of the divine, where, by the galvanizing power of Christ's mystical marriage, their souls are fused supernaturally into an indissoluble unity, while "each bears the image, the one of Christ, and the other of the Church," His Bride (9:30).

And so the same divine charity, emanating from the supernatural union, so infuses itself into its earthly counterpart that the "order of love" has power always to flourish therein. That is to say, there is in this new being, so formed by sacramental welding, but one head and one heart, the head (the husband) directing in careful solicitude for the welfare of the whole, while the heart (the wife) claims for herself the "chief place in love." Thus as two in one flesh they shall show forth in their lives the radiance of that supernatural marriage until God calls them to partake of its fullness for all eternity.

#### Assimilation

1. What is lacking in the analogy of a picture as the symbol of Christian marriage?
2. Where does Christian marriage get this supernatural "aliveness" that animates it?
3. In the analogy of the electric current, what does the "dull metal" represent?
4. What are the two poles for the circulating current?
5. What change does the current produce in passing through the metal?
6. What two kinds of grace does Christ impart through Christian marriage?
7. What two things are implied in calling marriage a sacrament?

<sup>1</sup>In the case of those who live in districts where no priest resides, and who cannot without serious hardship go to one, the new law (of 1908) provides that, if such condition has lasted a month, they may marry without a priest, but in the presence of two witnesses, the record of their marriage being properly made as prescribed" — *Catholic Encyclopedia*, Vol. IX, p. 7011.

8. Who is the minister of the sacrament of matrimony?

9. Where do the bride and bridegroom get the power to administer a sacrament?

10. What is the visible sign that constitutes the rite of the sacrament?

11. What is the priest's part in the marriage ceremony?

12. Whom does he represent?

13. Why is the Church so insistent on his presence as a witness?

14. Can the sacrament of matrimony be imparted when only one of the parties is validly baptized? Give reasons.

15. Using again the symbol of the electric current, describe what the sacrament of matrimony does to two souls whom it unites.

16. In this supernatural union so formed, whom does the husband represent? the wife?

17. What Scriptural authority have we for the above comparison? (Ephesians V.)

18. In the new being formed by the union of the sacrament, what part does the husband become?

19. What are his functions therefore?

20. What part in this new body does the wife become?

#### Discussion

1. When was marriage first instituted? By whom? (Read Genesis, Chapters I and II.)

2. What is the primary end of marriage? (Cf. Encyclical of Pius XI, *On Christian Marriage*.)

3. Can state laws validly prevent the fulfillment of the primary end of marriage? Give reason.

4. Can the civil authority dissolve a marriage? Give the reason.

5. Is the Nuptial Mass an integral part of the sacrament of matrimony? Why should Catholics try to be married at a Nuptial Mass? (Cf. *St. Andrew's Missal*, p. 1919, for

the mystery of which Mass is a symbol.) In what sense are the newly married couple "priest and victims"? What special blessing do they miss if not married in a Nuptial Mass?

6. Study the text of the Nuptial Mass.

a) What graces does the Introit ask? the Collect?

b) Of what great mystery does the Epistle remind us?

c) What does the Gradual ask from God?

d) In the Gospel how does Christ make known to His listeners the indissolubility of marriage? (He expresses this in two ways.)

e) What attitude on the part of the newly wedded couple is expressed in the Offertory?

f) Those who, through indifference or other culpable reasons, neglected to be married at a Nuptial Mass — have they the right to this same confidence in God's assistance?

g) Here is one instance where the unchanging Canon of the Mass is interrupted, so that the priest may pray for the bride and bridegroom in the name of the whole Church. For which of the spouses does he pray especially? What virtues does he ask in particular?

h) What two special favors does the nuptial blessing implore?

7. The giving of the ring was an old pagan custom, which the Church now blesses with her own prayers proper to the occasion. Tertullian claims that the ring is a symbol of fidelity; another ancient Father calls the ring a "seal" as a sign that she who wears it is the mistress of the household. What graces does the priest ask when he blesses the ring?

8. Considering the "oneness" of a wedded couple, what do you think of the wife following a career after her marriage? You might receive some helpful suggestions on the natural plane from *Marriage as a Career*, by Charlotte Muret, in *Harper's*, August, 1936 or *The Reader's Digest*, September, 1936.

## The Book Report: Aims and Approach

Brother Azarias Thomas, F.S.C.

Perhaps of all fertile educational devices, the book report is the most neglected, often the most underrated. Too frequently it lapses into a routine hardship which "must be in"; a kind of necessary evil, a penalty haunting the pages of an otherwise perfectly fine book. This danger of hidebound routine, opposed to anything calling upon the initiative or resourcefulness of children, is especially noxious in the case of book reporting. Not only is little thought given the work (which perhaps has been paraphrased from another's efforts) but, worse still, the truly elevating aims of the report are themselves defeated. Just what these aims are and how, by a sort of reverse reaction, the carelessly assigned or toilsome report can nullify them, deserve our serious attention.

#### Ultimate Aim

Underlying every other purpose of the book report is the primary purpose of stimulating and solidifying the reading habit. Here, indeed, is a good habit, at once an aptitude and an asset. Religion excepted, nothing in academic training can compare with it, for it reaches deep into later life. The average pupil's adulthood will be either very happy and mentally fruitful, or else very insipid, possibly immoral, depending largely on whether the reading habit was properly nurtured and guided during school years. Skill-

fully planned, enthusiastically assigned, and supervised by an interested teacher, the book report is a foremost means of making children lovers of books. It trains them to bring a useful purpose to their reading and teaches them to take away something useful or pleasurable. On the one hand, it is a travelogue, vitalizing their trip through other lives and other climes, pleasantly showing them *what to look for*; then again, it is a diary, unshackled and articulate, skipping from cold memoranda to personal opinion on things and people, voicing comparisons and contrasts, and offering the student a richly educational means of formulating concretely those reactions he felt while reading. Every child senses a personal triumph in having completely finished a book, even an "assigned" book. Usually he seeks to advertise his achievement, and often he will discuss the pages with his companions. Capitalizing on this tendency,

**EDITOR'S NOTE.** This, as you will agree, is not "just another article." The author has carefully set forth the results of academic study and years of practical experience. By following these suggestions and cautions, you too can obtain surprising results with book reports in either high school or grade school.

the resourceful teacher, particularly of English or history, can channel the pupil's literary aftermaths into organized departments of expression, so that, while desultory reading diminishes (without impairing the pleasures of random browsing) the healthy reading habit will take firmer root and develop into an easy aptitude for deriving profit and enjoyment from books. This priceless goal is implied in each of the specific aims of book reporting.

### Specific Aims

*Reading for content:* Herein the student's powers of observation and retention are exercised and trained. The book report proposes leading questions (by all means *interesting* questions, easily kept in mind without chilling the pleasures of a good book) whereby the reader will be alert both to the general theme and contour (*argumentum*) of the novel or essay, and a few worth-while particulars. Thus, in a story: Where are the pivotal points? Briefly, what is the gist? Which two or three characters dominate, and how is one of them particularly involved? (This apart from character study, which requires a distinct approach.) What is the story's general background? What factors led to this or that turn of events? (history.) And so on, depending on the teacher's purpose, especially as to the points he wishes to have emphasized.

Before beginning a book the pupil should have a fair knowledge of what he is to look for particularly. And very important it is to remember, that although the questions should be specific enough to demand a personal reading for proper answering, they should not be so pointed or so numerous as to harness the student's mind to distracting details when he is supposed to be enjoying his book. He should have sufficient scope and selection of ideas to record his readings. Here must enter the teacher's own tact, reinforced with a fair insight into the pupils' varied capacities. Some children will submit work of poor quality but sincere effort. The young reader easily becomes disheartened under a teacher constantly demanding long, accurate summaries; and, hard enough as it is to build up, there are few things harder to restore than the habit of frequent, worthy reading, especially if a teacher's unreasonable censure has brought on the child's antipathy to books.

*Reading for appreciation:* This is one of the richest fruits of the reading habit. A thoughtful process, it demands almost infinite patience and resourcefulness in the teacher who would develop it among children. Many young readers, and many not so young, believe that to appreciate a book is to like it; that if the book is boring or distasteful, it therefore cannot be appreciated. The report is a practical means of teaching children that appreciation in literature implies both sympathy and judgment: sympathy—a capacity to live with printed people and to walk and breathe in printed places; to think as others think, feel with them, look unblinkingly through their spectacles; judgment (sympathy's vital adjunct)—the faculty of discerning agreements and discrepancies between the book and the canons of art, taste, or morality. Is this process too involved, too mature for a school child, especially the grammar-school child? Not at all, if the teacher works deliberately and carefully, helping the child to place the simpler and more interesting things in his reading side by side with his background knowledge of such things,

thence inducing him to make intelligent comparisons. This habit of discrimination is invaluable, for besides instilling a sense of honest appraisal, through earnestly seeking every fact and viewpoint, it teaches the child to associate new facts and ideas with those already lodged in his mental background, thus helping him to consolidate his habits of learning. The book report can elicit intelligent appreciation from every normal child. In the beginning the process will be crude and incomplete; it is the teacher's task to gauge the process by means of well-planned and well-timed leading questions. By first appealing to the child's sympathy, the climb to his faculty of judgment will be a safe one, though frequently a long and arduous one.

*Reading for intellectual value:* Many and obvious are the intellectual dividends of good reading. Too often, however, we take for granted that our pupils are imbibing to the full every time they read, and simply because they read. We forget how easily a child can travel through a book without assimilating any of its proffered sweets. Attention, purpose, and thought wane to a minimum in such cases; the book is just another book to be read. A prominent cause of this apathy is the modern cinema, that music-haunted stream of consciousness wherein all our thinking is done on a screen, the while our imagination and brain power fold up in a kind of lethargic "time out." The cinema can indeed serve its educational purpose, but too much moviegoing renders children impatient of books that do not bristle from cover to cover with thrilling action. By preparing him for his reading, the book report proposes to stimulate in the child at once an interest in his books and an eagerness to take something worth while away from them, apart from the lone pleasure of having been interested. This stimulation is particularly aimed at through the channels of character study, reflective reading, and expression.

Complete facility in studying character is the prerogative of mature readers, for it implies acute observation, insight, and sympathy. But like every other aim of book reporting, it must be achieved through patience and skill. The child can gradually approach it by means of finger posts like these: How does such and such a character feel about a certain situation in the story? Why do you suppose he acted that particular way, not another? What action of his, prior in the story, makes it expected or unexpected of him to do or say this particular thing? How would you, or some friends of yours, have acted under the circumstances? etc. The beauty of earnest character study, even in embryo, is that it not only elicits maturer thought upon the human scene, but that it also wondrously marks the point of elevation between shallow, whirlwind stories and the better type of reading whose tides run deeper.

The term, "reflective reading," is so inclusive that anything said of it here can only scratch the surface of deeper significances. Book reporting aims very definitely to produce this habit in young readers. It asks, in effect: What is *your opinion* of this or that statement or passage, from the viewpoint of art, or ethics, or historical accuracy? Does any particular part of your reading throw open the gates to new knowledge, new interests or curiosities? What passages, or opinions, do you consider worth noting, worth remembering? What is your impression of the author? How does this book compare with his other writings? Is the book to be tasted,

swallowed, digested?—In fine, the student should be brought to realize, gradually and without pressure, that reading is more than a passive process, that it is a stimulating (but not boring) mental interaction between the book and his own intellectual background. Carefully cultivated, this excellent phase of the reading habit will never dampen the relaxation and emotional joy that should emanate from good books; rather, it will sharpen this enjoyment far beyond the dull pleasure of flabby reading.

A child's powers of expression are bound to nourish themselves with the phraseology and diction of good authors. The report, therefore, seeks to render the reader alert to the stylistic riches of worth-while books. It asks such questions as these: Show how the author said something in a way you particularly liked. If you were to memorize any short passage, which would it be? Does the writing resemble that of any other author? List a few new or very expressive words. (Vocabulary building is sometimes distasteful to younger children, but enthusiasm usually mounts with the words and the growing sense of achievement.) This general alertness to literary excellence is a vital step in the improvement and mastery of self-expression.

### Teacher's Approach

The aims of book reporting are stressed in this paper because of their fertile suggestiveness. However, each teacher knows best the schemes and methods likely to achieve these aims in his own class or classes. If the reading habit can be firmly implanted, a tremendous good will have been accomplished. The heavy task remaining will be to nurture this habit and guide it into channels that will best serve the child's moral and intellectual interests. It is a task in which the entire teaching staff can and should collaborate, including very especially the school librarian.<sup>1</sup> Important to keep in mind is the fact that the book report can be overdone, much to the disgust and discouragement of the young reader who rightfully expects at least a minimum of pleasure from his books. The book report is only a humble instrument, not an end. Following are a few brief suggestions diffidently offered as a means of common-sense approach to the book report:

1. Vary the written report with the oral.
2. Do not require every report to be absolutely comprehensive, covering for instance all the phases touched upon in this paper, nor two thirds of them. Each aim of book reporting implies at least partially all the others, hence nothing is lost in stressing the intellectual value of one book, the stylistic qualities of another, etc. Interest and action should dominate in younger children's readings. Above all, regardless of the children's years, the report should never clutter up their minds. The late Professor William Mathews wisely wrote: "Reading makes a full man, and so does eating; but fullness without digestion is dyspepsia."
3. Invest each report with a social significance by giving it some kind of circulation. The student should feel that his reaction to a particular story or essay is intended to

<sup>1</sup>In a paper, "The Children's Library" (*Our Children*, March, 1937: Catholic Charities, Archdiocese of New York), the writer has attempted to detail the active interrelation that should exist between librarian and teachers. The library is indispensable to the formation of the reading habit. Whereas the teacher shows the children how to read, the librarian shows them what to read. Effectiveness depends upon willing co-operation.

benefit his classmates as well; that his opinion is offered for their instruction, perhaps their debate. This approach will make his report a little more thoughtful, a little less parrot-like. He is conscious that his report will be memorialized beyond the cold tombstone of the teacher's mark book.

4. Frequently inject an element of challenge: Do you agree with the novelist's solution? with the essayist's viewpoint? Do you believe the book could have been better written in parts? Show where it offends literary taste. And so on, according to the teacher's

own definite schemes. However, project novelties should not swallow up the essential nature of the book report, which the pupils must realize to be earnest and real, and not a means of class entertainment.

A final suggestion would be to limit discreetly the number of required reports. Their purpose is ultimately to build up the habit of frequent, intelligent, enjoyable, and worthy reading. Overstepping this central aim they can easily leave in their confused wake the worst kinds of misguidance and discouragement.

## A Letter "A" Religion Test

A Benedictine Sister

1. Brother of Moses.
2. Son of King David.
3. A hermit.
4. Brother of Cain.
5. Father of mankind.
6. Patriarch of the Old Testament.
7. A table from which the Sacrifice of the Mass is offered.
8. A linen cloth worn around the shoulders of a priest at Mass.
9. A heavenly spirit.
10. A long white garment worn by the priest at Mass.
11. A Hebrew word used at the conclusion of a prayer.
12. A feast day celebrated forty days after Easter.
13. The fourth glorious mystery of the Rosary.
14. The vessel which Noah and his family inhabited during the deluge.
15. The twelve men selected by Christ.
16. The prayer which is sung while the priest sprinkles the congregation before high Mass on Sundays.
17. A day set aside by the church to commemorate all the saints.
18. A prayer recited three times a day in honor of the Incarnation.
19. One of the choirs of angels.
20. A day commemorating the faithful departed.
21. The first day of Lent.
22. A capital sin.
23. A church server.
24. Possessing all power.
25. A closed time including four Sundays before Christmas.
26. A church festival in honor of Our Lady (March 25).
27. To consecrate with oil.
28. A prayer uttered three times during Mass taken from St. John the Baptist in which he declared that Jesus was the true Messiah.
29. The continent in which Palestine is situated.
30. The last book of the New Testament.
31. One who supervises the bishops in his province.
32. The superior of an abbey.
33. The superior of a convent.
34. Depriving one's self of food or drink.
35. The exercise of the priest in the confessional to forgive sins.
36. Handmaid of Sarah.
37. Worship rendered a divine being.
38. Spiritual work of mercy.
39. Grace we need for every good work.
40. The three cards used on the altar during Mass.

41. A virgin saint, patroness of purity. Her feast is February 5.
42. A breaking away from religion after baptism.
43. A doctor of the Church for whose conversion St. Monica, his mother, prayed incessantly.
44. A saintly youth, belonging to the Jesuit Order.
45. An Apostle and brother of St. Peter who died on a cross shaped in the form of an X.
46. The mother of the Blessed Virgin.
47. The first sorrowful mystery of the Rosary.
48. A good work recommended with praying and fasting.
49. A young maiden who died for her faith at the age of twelve. Jan. 21.
50. An Easter greeting.
51. The Latin for "hail."
52. A Christmas hymn.
53. A heresy raging in France and conquered by St. Dominic through the devotion to the Rosary.
54. The right and power to act and command.
55. The mountain upon which Noe's ark rested after the deluge.
56. The native land of St. Augustine.
57. The Jewish elders.
58. A wicked king of Israel whom the prophet Elias rebuked and foretold a drought of three years in punishment for his sins.
59. A royal favorite of King Assuerus whose plan to kill the Jew Mardochai was frustrated by Queen Esther.
60. A bishop of Milan, one of the four great doctors of the Church, who was influential in the conversation of St. Augustine.
61. The diocese of an archbishop.
62. A Hebrew word for the name of God.
63. The king in the Old Testament who ordered the martyrdom of the seven Machabees.
64. First day of the unleavened bread.
65. High priest and father-in-law of Caiaphas.
66. A town in Judea, the birthplace of a certain Joseph, who, as a secret disciple of our Lord, asked permission to bury the body of Jesus.
67. A fragrant herb used to embalm the body of Jesus.
68. The husband of Saphira who concealed from St. Peter a portion of his money and as a punishment was struck dead.
69. The first seat of St. Peter before he went to Rome.
70. A celebrated city of Greece where St. Paul preached the gospel of the "Unknown

God."

71. The Latin for, "In the year of our Lord."

72. One of the capital sins which shows excessive love of gain.

73. A Franciscan saint favored with a vision of the Child Jesus. His statue is placed on our side altar in church for veneration.

74. A pretended Christ, who will be conquered by the real Christ at His second coming.

75. A doctor and defender of the church whose feast is celebrated May 2.

76. A symbol of hope.

77. The side divisions in a church.

78. The Hebrew for "father."

79. The first prayer of the Rosary.

80. A Latin hymn often sung in honor of the blessed virgin.

81. The native country of Job.

82. The home of the founder of the Franciscan Order.

83. The month in which we celebrate the Assumption of our Lady.

84. The month in which we celebrate the feast of St. George, patron of England.

85. The patron to be invoked for toothache because at her martyrdom all her teeth were torn out.

86. A short ejaculatory prayer as, "My Jesus mercy."

87. The annual commemoration of an event.

88. A tribe of Israel.

89. Founder of the Redemptorist Order.

90. Remarkable appearances made by God in an extraordinary manner.

91. Time of life at which children are held responsible for their acts.

92. Leader of the Huns whom St. Leo met at the gates of Rome and urged him to turn back.

93. An establishment of religious men.

94. The name of the Supreme Being in use among the Mohammedans.

95. A year book giving information concerning feasts, fast days, etc.

96. The enclosed space of a Roman amphitheater where many Christians were martyred.

97. Devotion toward the unveiled crucifix on Good Friday.

98. To set free; to forgive.

99. One who denies the existence of God.

100. The curtain hanging from the altar table to the floor.

Select Your Answers from the Following

- |                       |                      |
|-----------------------|----------------------|
| Words:                |                      |
| 1. Aaron              | 25. April            |
| 2. Aloysius           | 26. August           |
| 3. Absalom            | 27. Agatha           |
| 4. Andrew             | 28. Assisi           |
| 5. anchorite          | 29. Aloysius         |
| 6. Ann                | 30. altar cards      |
| 7. Abel               | 31. Arabia           |
| 8. Agony              | 32. actual grace     |
| 9. Adam               | 33. admonish sinners |
| 10. alms giving       | 34. adoration        |
| 11. Abraham           | 35. Agar             |
| 12. Agnes             | 36. Ave Maria        |
| 13. altar             | 37. Apostles Creed   |
| 14. Alleluia          | 38. Aba              |
| 15. amice             | 39. Age of reason    |
| 16. Ave               | 40. absolution       |
| 17. angel             | 41. abstinence       |
| 18. Adeste Fideles    | 42. anchor           |
| 19. alb               | 43. Aser             |
| 20. Albigenian heresy | 44. Alphonsus        |
| 21. anniversary       | 45. apparition       |
| 22. aspiration        | 46. Ark              |
| 23. Augustine         | 47. abbas            |
| 24. Apollonia         | 48. Athanasius       |



# New Books of Value to Teachers

## Weather, Earth, and Animals in Books

Carroll Lane Fenton, Ph.D.

Recent months have produced many books for children, in the fields of nature and science. A few are basically important; some are exceptional pieces of bookmaking; many are interesting and useful. A comparatively few are poor. Most of these are marred by faulty planning, rather than by any departures from reliable scientific fact.

Most outstanding of the basic books is Gayle Pickwell's *Weather* (Junior Literary Guild, \$3). In it, we at last have a work which explains the weather simply, adequately, with dignity, and in terms suited to high-school students as well as teachers. One long chapter tells what weather does; three chapters suggest how it may be studied. Illustrations consist of good diagrams and almost 50 large and beautiful photographs.

*Introducing the Constellations*, by R. H. Baker (Viking, \$2.50), is astronomy for readers of high-school age. It is a guide to observation of stars; users still will find need for the older, more comprehensive *Stars for Sam*, by W. M. Reed. If only one of these can be purchased, it should be the comprehensive book.

The earth generally fares poorly, especially as compared with the stars. But *The Earth Changes*, by Janet Lucas (Lippincott, \$2.50), does a more than competent job. Miss Lucas is a scientist as well as an author; her account of earth changes is reliable and may be used from sixth grade through tenth. Yet her book does not give the whole story of geology and its meaning to man. In that field there still is no adequate work for either juniors or adults.

*On the Air*, by J. J. Floherty (Doubleday, \$2) is a brilliantly illustrated story of radio. Science is not its major concern, yet readers will realize that physics have made both broadcasting and reception. They also will glimpse the thrill of experimentation: science cannot be dully cold in the vital person of Marconi. The book seems to range from 10- to 14-year-olds.

Physical science gives one good book in each field — chemistry being excepted. Botany has been slighted, too; its new titles are few and none deserves commendation. Zoology, however, is another matter. In this field, new books are quite abundant.

Most teachers of nature study use insects, which form good subjects for observation and even can be reared with ease. They will welcome *Insect People*, by King and Pessels (Harper, \$1.25), a book of excellent pictures. Its chief faults are small size and board binding, which will not endure much use. Physically, the book offers less than Bronson's *Wonder World of Ants* (Harcourt, \$1.50), which reviews these important insects for children of 8 to 12. It contains the usual effective Bronson drawings and enlivens principles with humor that never become merely flip. There is need for companion books on many other groups, but the only one in this year's lists is *Termite City*, by Emerson and Myers (Rand McNally, \$1.50). It is solidly made, with an eye to school use; its contents have authority; its practical value is great in those regions where termites are serious pests.

*Termite City* should find special welcome on the Pacific Coast, but it will be useful in most junior high schools.

Insects, and nature study as a whole, show their inspirational value through E. Doorly's *Insect Man* (Appleton-Century, \$1.50). In it, children visit the home and reconstruct the life of Fabre. The method is unconventional but effective. Miss Doorly should write similar volumes on American naturalists, whose homes are more easily reached than is the countryside known to Fabre.

Catholic teachers can make good use of D. Lathrop's *Animals of the Bible* (Stokes, \$2). Combining nature study with devotion, it may be read by second or third graders, or may be read to the first grade. The distortions found in Miss Lathrop's drawings will not trouble the average child.

Another good book for young readers is *Down Comes the Wilderness*, by M. E. Price (Harcourt, \$1.75). It tells of bears and other forest animals which are returning to a region that once was farm land. In so doing, they illustrate a process of geographic importance in northeastern United States.

Of books which tell animal stories, the most beautiful is *Tawny Goes Hunting*, by A. Chaffee (Random House, \$2). Tawny is a puma cub, who does a great deal more than hunt. He, his neighbors, and his mother, are excellently shown in drawings by Paul Bransom. If the book cannot be purchased by a school, teachers may commend it strongly to their public librarian. They may do the same for *Beaver Pioneers*, by W. and L. Chapman (Scribners, \$2), which is better than other books about these important animals. The Chapmans are not scientists, but they know beavers intimately and present their activities in a sound, interesting story. They also write for older readers than those reached by such books as *O-Go* and *Flat-tail*.

Elephants also are important to man — and they typify the East. There are beautiful

photographs of them, and their training, in *Sabu the Elephant Boy*, by F. Flaherty (Oxford, \$1), a book which most libraries will welcome for its quality and modest price. For a story, we turn to M. Buckingham's *Rajah the Elephant* (Scribners, \$2.75). It gives a biography, simple enough for 8-year-olds, yet with substance enough to warrant reading by students in the fifth grade. Retarded pupils of seventh grade may use it, appeal of the subject compensating for age discrepancies and style.

For Africa, W. Wilverding's *Punda the Tiger Horse* (Macmillan, \$2) tells the life story of a zebra. Based on first-hand knowledge, with good illustrations, it forms a good companion to its author's *Jangwa* (a lion) and *Keema* (a monkey). It will be most useful, perhaps, in giving geography classes an impression of the South African veldt. Text will be read by fifth to eighth graders, though words seem best suited to grade six.

Important American beasts appear in *Perky*, by A. Atkinson (Viking, \$1.50), and *Cheeky, the Prairie Dog*, by J. Lau (A. Whitman, \$1.50). *Perky* is a skunk, whose services to the farmer are great, and who has an amazing ability to mind his own affairs. *Cheeky's* race has fame as pests; they have been trapped and poisoned so efficiently that thousands of children cross the West without seeing one prairie dog. Such destruction no longer is warranted; it wastes public money, brings small profit, and may rob us of an interesting creature which lives well where sheep and cattle do harm. *Cheeky* is not propaganda, but it may arouse interest in a beast that should be preserved.

Younger readers than those to whom *Cheeky* appeals will learn much from E. Arnold's *Wild Americans* (A. Whitman, \$1.50). In it, two children go trailer camping, meeting the average wild creatures of American roadsides. Trailer travel makes the book timely, and should suggest thoughtful travel to youngsters who too often merely traverse miles. The teacher who makes *Wild Americans* do that will perform a valuable service — one which often is left to the uncertain efforts of recreational advisers.

## Three Books for Nature and Science Teachers

### Nature

By Bertha Stevens, Houghton Mifflin Co., 1936. 277 pp. Vol. 3 of Childhood series; 5 vols., \$18.50.

### Science in the Elementary School

By W. C. Croxton, McGraw-Hill Book Co., 1937. 454 pp. \$3.

### The High-School Science Teacher and His Work

By C. E. Preston. McGraw-Hill Book Co., 1936. 272 pp. \$2.

Most teachers of nature study face questions. Just what is it — and what should it be? What are its values to the child, and what does it offer that may be kept as child becomes youth or adult? What are its links with the arts? Should it be kept in curriculums already sadly crowded?

Though her latest book is addressed to parents, Bertha Stevens gives the best answers to these queries that teachers are likely to find. Her view is inclusive and rests on a broad conception of education as cultural and physical growth. She shows that nature study develops, even more that it informs. It also provides poise, alertness

and ability to appreciate, which last though the child becomes a man bound to routine labor. It puts art into living, tangible form, and gives beauty and purpose to play at no cost of obtrusive guidance. It provides background for studies which range from geography to literature. Well taught, it helps meet a grave problem: useful, healthful, good use of the leisure forced upon us by machines. It even brings lost values back to the teacher, thus atoning for any load it may add to her already burdened schedule.

This is high praise, but it is justified by Bertha Stevens' own work. It also is consistent with the growth of nature study itself, and the extent to which it is fostered by social leaders. But how is such praise to be earned by the individual teacher or course?

*Nature* answers this question with only a general program. The thoroughly prepared teacher may use it, determining course content from her own experience. Other teachers or schools need more detail, yet many are unwilling merely to follow the courses laid down in textbooks. They

want guidance, but freedom of decision as to what shall be presented and when. This guidance is provided by Professor Croxton's *Science in the Elementary School*.<sup>2</sup>

Dr. Preston's work is a textbook for colleges and normal schools. It also addresses the teacher in science, since her problems resemble those of the student who handles practice classes. Skeptical of her own approach, such a teacher may compare it with objectives which hold that science teaching must inform, develop abilities and tastes, and leave a residue of knowledge which will help the greatest number of students in postschool years. Some chapters suggest materials and methods; four which have special importance outline plans and goals in laboratory work. Dr. Preston has not solved all laboratory problems, but he does suggest a way to avoid the harm of haste, routine, and artificial standards. He also gives a chapter in vitalizing the notebook—if possible, by making it a common-sense, natural account of work done by the student, and his ideas of its application. Exercises follow each chapter. Designed as assignments, they also may guide thought by teachers and administrators who must decide what science shall be in high schools whose problem, more and more clearly, is to help millions of students live, rather than merely to prepare thousands for four years of college study.—*Carroll Lane Fenton*.

*Science in the Elementary Schools Including an Activity Program*

By W. C. Croxton, Ph.D., cloth, 454 pp., \$3. McGraw-Hill Book Co., 1937.

The title page of *Science in the Elementary School* makes the major content minor. Two thirds of the book is the "Activity Program," a program which may be used from the first grade through the eighth. In the foreword of Part II, Dr. Croxton says: "For various reasons grade placement has not been indicated for most of the activities. Objective evidence on which to base grade placement in elementary science is very meager. So little has been done in elementary science in many schools that it is not safe for a teacher to assume that her pupils have a background of experience from the work of the preceding grades."

The "Activity Program" is divided seasonally—autumn, winter, and spring—each with 34 outlines. There is sufficient source for eight years.

Part I of this "Brief Textbook for Elementary Teachers" is based on the "new method of teaching" which is the broad generalizations of science by interaction with environments. Method is called "an enterprise." By enterprise is meant the transfer of training, not the mere reading and recitation of information, but undertakings which prove recognition of need, purposing, planning, executing, judging, and often perfecting.

Aims are considered as the determining influence in curriculum construction. The foremost aims of science teaching in the elementary school should be the opening of avenues of interest and satisfaction.

One chapter is given to "science in our changing elementary curriculum," followed by one appraising results. The two last chapters are on the professional requirements of a teacher of elementary science.

In Part II, "An Activity Sourcebook" usually three, sometimes four pages are given to "Aims," "Suggestions," "Contributing Learnings" and references of each topic. The topics are not classified but could be listed as trees, flowers, bulbs, mosses, animals, birds, insects, rocks, stars, the sun, the moon, water, electricity, the earth, ice and glaciers, gases, bacteria, foods, toys, airplanes, and conservation, safety, and explorations.

The "Aims" remind the teacher to begin each new phase of teaching with renewed zest. The formulation of these several hundred "Aims" is an achievement Catholic teachers should emulate.

The enterprise "Suggestions" are not repetitions. All are usable. "Most of the necessary materials are readily obtainable at little or no cost."

The "Contributing Learnings" give the teacher quickly obtained information to ask questions and to answer those the children may ask. Of particular worth are lists. For example: Uses that we

<sup>2</sup>See review of this book by Sister M. Gabriel.



## READING The MAGIC HIGHWAY TO ADVENTURE

Book Week, Nov. 14-20\*

make of science; Observing the happenings on a windy day; Observing the effects of an April shower; Exploring by sound and touch; Listing our friends and foes; Insect damage; Insect-benefit; Winter bouquets; Street fixtures; Signs of the coming season; Tracks in the snow.

A correlation of a safety program, and a science program could choose: Exploring the school ground; Overheating and severe chilling; Thermometers; Importance for waiting for ice to be tested before skating; Observe caution signs about machinery; Cleanliness and care to ward off disease; Exhibits showing damage and benefit from insects. Appreciation and charity are reciprocal with interdependence which in this book is analyzed in every phase.

Of particular interest is "Showing how our toys work." The mechanisms are explained of dump trucks, automobiles that run, gliders, airplanes that fly, caterpillars, tractors, popguns, sleds, yo-yos, bows and arrows, Sandy Andys, Tumbling Tommys, whistles, harmonicas, "Ma-ma" dolls, tricycles, bicycles, tops, boats, and floating birds. And experiments of finding and making objects that float, control of a fleet of toy boats by the use of magnets, making toy wind, water, and steam-generating toys, and other devices.

There is little deviation from the scientific, but occasionally there are gems of advice, as "It is a part of our education to learn to eat a wide range of foods for citizenship as well as for health. We are better guests and better members of social groups when we learn to enjoy the food served." The book is recommendable to the language teachers for its thousand subjects for composition writing. The work is dedicated to "those teachers who, handicapped by lack of adequate background, training, and experience in science and science education, are facing new duties with professional zeal."—*Sister M. Gabriel, O.P.*

### Government in Action

A Study of Problems in American Democracy. By Robert E. Keohane, Mary Pieters Keohane, and Joseph D. McGoldrick. Cloth, xvi-845 pp. Harcourt, Brace and Company, New York, N. Y.

*Government in Action* is a textbook for high-school juniors and seniors which has grown out of classroom use. It was originally tried out in mimeographed form for several years in the University high school at the University of Chi-

\*A reproduction of a large poster which may be obtained from the National Association of Book Publishers, 347 Fifth Ave., New York City.

cago by two of the authors of the book. They fortunately had associated with them Professor Joseph D. McGoldrick, of Columbia University, who has had wide experience also in government service. Judging by the result, this is one of the happiest collaborations that we have seen in the textbook field.

The title of the book indicates its general point of view—*government in action*. While the theory of government is not neglected, its presentation is always in connection with functional government. The textbook apparently is intended not only for the regulation course in civics or government but also for a course in problems of democracy. The whole work is considered as a unity and the material in the units is not taught once and then forgotten but is made available in the subsequent units. The style of the text is rather simple and conforms to the authors' intention that it be used for the average student rather than the superior student. It is a very simple style. However, although the general body of the text is intended for the average student, there is superabundant opportunity in the pedagogical material to use up the energy of the brightest student. The scope of the book may be indicated in the title of the eight units which compose it:

1. The Nature and Purpose of Government
2. Four cornerstones of American Government
3. Securing the Consent of the Governed
4. How Governmental Policies are Made and Carried Out
5. How Our Governments Promote the General Welfare
6. The United States in the Family of Nations
7. Financing our Governments
8. The Citizen's Relation to His Government

There is one aspect of the book that needs special comment—it is the number and excellence of the illustrations, whether they are photographs or numerical statistics or actual statistics or charts or diagrams or documents or maps. The teacher will find in these illustrations an exceptionally fine illustration and extension of the text.

There is another aspect of the book that is of supreme importance in these days—the emphasis on government as a means, an instrument. It is not an end. It is for service. Public officials are public servants. There is no greater lesson about government than this, and I trust teachers will do well to use every opportunity which the book affords to drive this lesson home again and again.

Still another related aspect of the book is the emphasis on public service as a career, the need for training for the public service, and the calling of attention to "career" men and women. This is, of course, an aspect of the emphasis in the book on government in action.

Introducing each unit is a brief statement about the purpose of the unit, and at the end of each chapter is a series of pedagogical materials divided ordinarily into four principal groups, (1) a series of student activities based on the textbook itself; (2) a series of student activities based on the life of the community; (3) a series of student activities based on a study of the material available in the classroom library; and (4) a list of more difficult additional readings and reports.

The makeup of the book is excellent in every way—type, illustrations and mechanical arrangement of pages. *E. A. Fitzpatrick*.

### La In Music Land

By Georgia Stevens. Cloth, 160 pp., illustrated. 40 cents. The Macmillan Company, New York City.

This is the third-grade book in the Tone and Rhythm Series, by the director of the Pius X School of Liturgical Music, College of the Sacred Heart, New York City. It aims, through the coordination of tone, time, and rhythm, to give the child a firm foundation in the elements of theory and appreciation, and the ability to sing. The special method used is explained both in the children's books and in the special teachers' manual.

### The Rite of Baptism of Adults

By Rt. Rev. Msgr. W. R. A. Marron. Paper, 62 pp. 10 cents. The Liturgical Press, Collegeville, Minn.

A translation and explanation.

# The Fabric of the School

## FIRE DRILLS AND FIRE PREVENTION

Material on fire prevention may be secured from your state fire marshall. Your local fire department will be glad to send a man to your school to talk to the pupils and will assist you in planning fire drills, etc.

Since most of the loss of life in schoolhouse fires results from defective stairways, lack of ready exits, and confusion and panic, it is of supreme importance that you check these items in your school and conduct fire drills frequently.

During a fire drill pupils should march at least a block away from the building so as not to interfere with the work of the firemen in case of a real fire and to be out of danger.

A city superintendent asks his principals to check the following:

1. Are your fire gongs in good condition for service? See that all ropes, wires, etc., are in good repair.
2. Are all fire extinguishers in good condition? Note the date of refilling.
3. Are all doors in good working order? Instruct your janitor or other authorized person to see that all exits are unlocked at all times while school is in session.
4. Are all stairways and halls clear of obstructions? It would be well to have a representative of the fire department check your building for fire hazards.
5. Is there any material in hallways, under stairs, or in other places, that is inflammable or likely to cause spontaneous combustion? Observe where janitors keep all dust cloths, mops, cleaning material, etc.
6. See that your janitor understands his responsibility for keeping exits unlocked for storing his cleaning materials (especially oily rags) so that they will not be a fire hazard.

## TEMPERATURE AND HUMIDITY

How warm should a classroom be kept? If this were a matter of opinion, a variety of answers might be expected, dependent upon the reactions of different people as influenced by their responsiveness to temperature changes, the amount of clothes they wear, and their physical activity.

Man lived in relative comfort for thousands of years in dwellings heated only by wood fires which kept the room temperatures only a few degrees higher than the outside air. Since the introduction of steam heat, men have adapted themselves to a mild degree of parboiling, and some have grown to like it.

Dr. C. E. A. Winslow of Yale University has conducted a series of scientific investigations into the relationship of health to room temperature, especially as regards school-rooms. He has found an intimate connection between room temperature and diseases of the nasal passages and lungs. In general, he finds that it is healthier to be somewhat cold than to be too warm. A temperature of between 68 and 70 degrees was found to be without question the most healthful for the school-room. The lower temperature was considerably more desirable, especially in classrooms where the children were permitted to be active, in accordance with modern pedagogical thought. Children confined to classrooms at temperatures much greater than this suffer much more from common colds and influenza. Tuberculosis

## National Summary of All Classes of Catholic Educational Institutions 1935-1936\*

	No. of Schools	Rel.	Instructors		Men	Students Women	Total
			Lay	Total			
<b>Seminaries:</b>							
Major .....	93	921	32	953	8,019	.....	8,019
Preparatory .....	79	993	85	1,078	9,427	.....	9,427
<b>Universities and Colleges:</b>							
Universities .....	23	1,141	4,106	5,247	44,303	23,552	67,855
Men's Colleges .....	56	1,215	570	1,785	18,052	5,772	23,824
Women's Colleges .....	105	2,703	1,057	3,760	316	36,428	36,744
Diocesan Teachers' Colleges .....	5	157	45	202	87	2,731	2,818
Normal Training Schools .....	36	764	117	881	322	7,401	7,723
Secondary Schools .....	1,945	14,121	2,663	16,784	124,265	160,471	284,736
Elementary Schools .....	7,929	55,467	3,436	58,903	1,056,017	1,046,872	2,102,889
<b>Total .....</b>	<b>10,271</b>	<b>77,482</b>	<b>12,111</b>	<b>89,593</b>	<b>1,260,808</b>	<b>1,283,227</b>	<b>2,544,035</b>

\*Prepared by the Department of Education of the National Catholic Welfare Conference.

and other respiratory diseases frequently follow.

But temperature is not the only factor in the control of air. Air movement and moisture are also found to play an important part. Dr. Winslow completely exploded the Germanic myth that a continuing change of air was essential. As incorporated in the school law of many states, this pseudo-scientific assumption calls for the mechanical introduction of air into classrooms at the rate of 30 cubic feet per minute. Dr. Winslow proved that if the air was kept in motion by means of fans, or by means of the simple draft brought about by a slightly open window, a classroom full of air could be used continuously by a group of children all day or for several days, without evidences of discomfort or loss of alertness. The peculiarly unpleasant body odors present in a room which has thus been continuously used can be considerably reduced if the air circulates, and bear no relationship whatever to the depletion of oxygen content. Lastly, a minimum amount of moisture appears to be necessary in order to reduce the tendency toward respiratory difficulties. Warmed air particularly is liable to be lacking in moisture content.

Fortunately, expensive equipment is not necessary to give effect to these recommendations. A stove, a thermometer, an open window, and a pan of water are the essential elements. One may, of course, substitute radiator for stove. The thermometer is essential, for it is the only accurate means of determining the actual room temperature. One's personal feelings are utterly unreliable. Such a thermometer may be hung from the ceiling in the center of the room, or two may be placed on opposite walls one on the exterior wall near the windows, the other on the opposite interior wall. In view of the fact that air temperature varies at different heights in the room, the thermometer should be located in the air layer occupied by the children.

When the thermometer rises above 70 degrees, it is time to do something either to the stove or to the windows. Some form of deflector board at the window sill is all that is necessary. Deflector boards might with advantage be placed on all of the window sills. Such a board may be made of anything from a sheet of plate glass to a piece of lumber out of a packing case. Even stiffened cardboard would be adequate. This board should fit snugly against the window sill at the point

where the window opens and extend from 12 to 14 inches above the sill. It should slope back so that the upper edge is from two to four inches away from the window. A current of air entering through an opening of the lower sash will then be deflected upward and will tend to set the air in the room in motion above the children's heads, thus avoiding a draft.

Patented humidifiers which may be hung on the radiators are on sale in a number of hardware stores. As a matter of fact a majority of them are inferior to a pan full of water near the stove or under the radiator. A desirable humidifier is one that offers the largest possible water surface from which evaporation may take place. Most of the patented devices offer only a limited surface from which the water may evaporate.—J. G. Townsend, M.D., Director of Health, U. S. Bureau of Indian Affairs.

## DEWEYISM IN EDUCATION

"The prestige of Professor Dewey is an amazing phenomenon, one of the most interesting of our national life. It is a study in institutional prestige—'expert publicity'—and an admirable placement service which is successful in supplying superintendents of education all over the country.

"As a matter of fact, the influence is international. For when Mexico decided to enlighten itself with the new Socialist schools, a sympathetic and guiding hand was stretched all the way from Morningside Heights (Columbia University) so that the Government Normal School in Mexico City today is the flower of Professor Dewey's genius.

"Few men, indeed, have enjoyed more victories. In his old age he can say with truth that American education in both primary and secondary schools is Deweyism; the only fly in the ointment being that there is something the matter with American education—and let it be whispered, we know why.

"The reason is that no education is superior to the philosophy which is its foundation, and Dewey's philosophy is absolutely inadequate. It is simply a compound of experimentalism, pragmatism, and socialism; each 'ism,' of course, has an element of good, but in their present exaggerated form they are false foundation stones—and false foundation stones are dangerous."

The quotation above is from an address of Rev. Robert I. Gannon, S.J., president of

Fordham University, to Catholic teachers of New York City.

Father Gannon maintained that the most dangerous of Dewey's philosophy was its exaggerated experimentalism. "Prudent experiments in education are signs of vitality," he said, "but nothing worse has been done to American teachers than persuading them to scrap the past and begin all over again as though there were a new human nature in the world, as though the elements of life were not eternal."

#### AMERICAN EDUCATION WEEK

American Education Week will be observed throughout the nation November 7-13. The observance is sponsored jointly by the National Education Association, the United States Office of Education, and the American Legion.

The public is invited to visit the schools during this week. Last year nearly 7,000,000 parents and citizens availed themselves of this opportunity. Catholic schools would no doubt find it a stimulant to interest on the part of parents, if the latter could get the habit of dropping into the classroom to observe the teaching. This is expected by public-school teachers. At least, during National Education Week, invite the parents to come to school. And get your Home and School Association interested in arranging an Education Week Program.

### Catholic Education News

#### Catholic Library Meeting

The Catholic Library Association will hold its second annual regional conference at Mt. St. Scholastica College, Atchison, Kans., November 6. Catholic librarians from Colorado, Kansas, Oklahoma, Nebraska, and nearby cities of Missouri will attend. There will be meetings for college, high-school, and hospital groups.

#### Catholic Dramatic Movement

In anticipation of a busy season, The Catholic Dramatic Movement has enlarged its departments and created two new divisions. *Practical Stage Work*, the publication of the Movement, now appears in the form of a 22-page magazine with many helps for the amateur stage. The magazine is sent free to members of the Catholic Dramatic Movement and to others at \$1.50 per year. Membership at \$5.00 per year entitles a person or a club to: (1) Free copies of 10 to 20 plays; (2) reduced royalties or no royalties; (3) free information; (4) rental of costumes; (5) the illustrated magazine. The address of The Catholic Dramatic Movement is Oconomowoc, Wisconsin.

#### Catholic Education in Kansas

In the Diocese of Wichita, last year the elementary-school enrollment, diocesan and private, was 6,297 and the high-school enrollment 770. The former was a decrease of 59 pupils compared with the preceding year, which had shown an increase of 273 over its predecessor. The high-school figure of 770 was an increase of 21 pupils. Several parishes opened new schools or added grades. These figures are contained in the annual report issued by Rev. Leon A. McNeill, diocesan superintendent of education.

Diocesan examinations were given in several subjects in most of the schools. Special attention was given to the Confraternity of Christian Doctrine, to the organization of the Sodality in both elementary and high schools, and to the cataloging of the libraries in the elementary schools.

The report outlines a nine-point Confraternity program, gives a list of standard equipment for schools by grades, and summarizes the work of 71 vacation religious schools. It also treats of the Catholic Action Committee, study clubs, street missions, lay retreats, mission activities, and health work in the schools.

The education department of the National Catholic Welfare Conference, 1312 Massachusetts Ave., N.W., Washington, D. C., has prepared a program for the celebration of National Education Week in Catholic schools. The theme chosen for the Catholic celebration is The American Constitution.

It might be well also to write to the National Education Association, 1201 Sixteenth St., N.W., Washington, D. C., for one or more packages of posters (11½ x 17 inches) in three colors. These are sold only in packages of 10 at 40 cents per package.

#### RURAL FIRE PREVENTION

The need of adequate inspection and safeguards against farm fire and explosion in rural schools was emphasized by Secretary of Agriculture Henry A. Wallace in urging observance of National Fire Prevention Week.

Last year about 3,500 people lost their lives in farm fires. The property loss was approximately \$100,000,000. This does not include the fire loss in the nonfarming rural communities—villages, towns, and cities of less than 2,500 population—which is estimated at \$125,000,000.

"The tragic explosion last March in a Texas consolidated school which killed 300 children and teachers reveals the shocking fact," said the Secretary, "that but few states make any provisions for inspecting rural schools against fire, explosion, and faulty construction." He urged that steps be taken to protect rural school children with the same strict safety laws that apply in the cities.

#### Research in Education at Fordham

Francis M. Crowley, Ph. D., former dean of the school of education of St. Louis University, has begun, as professor of education at Fordham University, a program of special investigation and research with a view to uniting all work in education now distributed in several schools of Fordham, into one school of education. His research will include a study of the curriculums in



Francis M. Crowley, Ph.D.  
Professor of Education and Director of  
Educational Research, Fordham Uni-  
versity, New York, N. Y.

education in both the undergraduate and graduate schools, their interrelation, and their relation to the city and the state certification requirements in teaching and administration.

#### Marquette Tercentenary

*The Restless Flame*, a pageant by Rev. Daniel A. Lord, S. J., will be presented in the Milwaukee Auditorium, November 9-11, in commemoration of the tercentenary of the birth of Father Marquette. The performance is in charge of a committee representing the city of Milwaukee, the county, and Marquette University. The pageant will portray scenes from a series of noted explorers in ancient and modern history ending with Father Marquette.

#### Report From Syracuse

In the Diocese of Syracuse, last June, there were 18,921 pupils in the Catholic grade and high schools, according to the recent report of Rev. David C. Gildea, superintendent. This number was 124 fewer than during the preceding year. There was a slight increase in the first grade. Enrollment in Catholic high schools was 3,090, the highest ever recorded. There has been a considerable increase in the percentage of eighth-grade graduates who enter Catholic high schools. In September, 1936 the percentage was 48.9.

The Syracuse report includes a summary of the work in music during the past year by Rev. D. G. Horan, supervisor. Plain Chant is taught from the fourth to the eighth grade. Father Horan made a plea for co-operation among teachers, pastors, and organists that children may be trained to sing at least the Ordinary of the Mass from their books.

Regulations of the diocesan school board require: Periodic inspection of buildings and prompt remedying of any condition affecting safety; monthly fire drills; approval of all building plans; regulation of holidays; following the uniform course of study; uniform textbooks for the grades; uniform diocesan examinations; prohibition of collections of money in the school or the asking of children to sell tickets, etc.

#### General News

☐ Sunday, September 19, was celebrated in the Diocese of Brooklyn as the Feast of *Christian Doctrine*. An appeal was made to all Catholics to join the Confraternity of Christian Doctrine, which has been established in all parishes of the diocese. ☐ On Sunday, September 12, Cardinal Dougherty celebrated a solemn pontifical field Mass in the municipal stadium at Philadelphia in commemoration of the 150th anniversary of the adoption of the *Constitution*. About 75,000 persons attended, including the representative of the governor, the mayor, and other officials, Holy Name societies, seminarians, children, and Church dignitaries. The Mass was celebrated at the invitation of Governor Earle and Mayor Wilson. ☐ Bishop Heelan of Sioux City, Iowa, has issued a pastoral letter on the *Constitution* urging that special emphasis be placed on its study in the parochial schools during this school year. ☐ The *Pax Romana Congress*, held in Paris during August, was attended by more than 750 Catholic college students. There were delegates from every country in the world except Germany. The chief subject discussed was "Unemployment of University Graduates." Other topics were: Collaboration of Catholic university papers; understanding of the Oriental churches; medical social service; professional organization of pharmaceutical students. The 1938 congress will be held in Yugoslavia, and the 1939 congress probably will be held in New York during the World's Fair. ☐ The *Academy of the Gallery of Living Catholic Authors* was formally opened at Webster College, Webster Groves, Mo., on October 9. ☐ Two hundred Sisters attended the 35th annual meeting of the principals and teachers of the *Diocese of Columbus* held early in August at St. Charles College, Columbus, Ohio. Papers were read on: Visual Education Commentators—Speaking and Writing, and English Texts. ☐ A Catholic lending library at Racine, Wisconsin, has outgrown its original quarters and is being moved to space provided at the convent (Continued on page 10A)